

## AROUND THE WORLD IN 50 DAYS

"Inside Dope"

by GEORGE F.  
TAUBENECK



Ed Flannery  
Story of the Week  
Foreign Cars  
Crime Doesn't Pay  
Marrying for Land  
As Advertised  
There's Another Hawaii  
Americanized Progress

### Ed Flannery

When word reached us of the death of Ed Flannery, Dunham-Bush vice president and one-time president of Refrigeration Equipment Manufacturers Association, there was the first thought of a great personal loss. And then we thought of the void at the annual ARI meeting in Hot Springs, Va.

Ed Flannery was probably the best known and best-liked individual who had ever attended the ARI meetings. It was not just because he was one of the real old-timers in the industry (he started in 1919), or that he had played an important role in the formation of the ARI. It was more likely that when you saw his genial Irish countenance, you just felt better.

Ed always got the job done—he helped to build his own company from small beginnings to a place as a major factor in the industry, and his accomplishments in industry association work are widely acknowledged. But more important, he left everyone feeling good after he got the job done.

It's not our policy generally to publish long personal eulogies. But Ed was something special to us—and to all in the industry who knew him.

### Story of the Week

At the information desk of a Honolulu travel agency sits a living doll, an eyefull in any language. Her parents must have had a premonition, because they named her:

Miss Noenoe Aana.

### Foreign Cars

A foreign invasion is sweeping Uncle Sam's Island Territory. Of all new automobiles sold here in the first three months of 1958, 43%—repeat, 43%—were small foreign makes. Another nine per cent were American Ramblers.

Every local car dealer now is franchised to sell Renaults, Hillmans, Volkswagens, etc.

### Crime Doesn't Pay

Islanders have decidedly non-criminal tendencies; and organized crime is non-existent.

Remember, these are islands.  
(Continued on Page 24, Col. 1)

### FORT WORTH

## 6,000 Cooling Systems Put In In Last 10 Years

FORT WORTH, Texas—Nearly 6,000 air conditioning systems totaling 72,241 tons have been installed here in the past 10 years, according to Texas Electric Service Co., public utility serving Fort Worth.

Summaries of installations made in the years 1948 through 1957 are classified by residential, commercial, industrial, and government and municipal jobs in the report prepared by the sales promotion section of the utility's Commercial Dept. in the Fort Worth Div.

The 10-year totals follow:  
Residential: 3,799 jobs, 18,303 tons.

Commercial: 2,073 jobs, 49,216.5 tons.

Industrial: 57 jobs, 3,924 tons.

Government and municipal: 46 jobs, 797.5 tons.

Last year, 1957, was best in terms of number of jobs, for it saw 1,362 installations represented.  
(Concluded on Page 7, Col. 1)

## MCA, NAPC Committees OK Consolidation

WASHINGTON, D. C.—The executive committees of the Mechanical Contractors Association of America and the National Association of Plumbing Contractors, at a joint meeting here, unanimously approved a resolution calling for consolidation of the two organizations, possibly as soon as next year, at this time.

The resolution will be submitted to their respective boards of directors just prior to the 1958 annual conventions of each organization in the next two months. The MCAA, Inc., meets in Los Angeles, May 20 to 23, while the NAPC will meet there June 30 to July 3.

The resolution calls for the executive committee of each organization to meet with the other "for the purpose of taking the necessary steps to bring

about a consolidation by drafting an organizational plan, including preliminary charter and by-law provisions, for the consolidated organization, with proper safeguards for retention

of local identity and autonomy, by outlining a program that would be of interest and value to all members of such an organization, and by outlining all  
(Concluded on Page 6, Col. 1)

## Europeans Find ASRE Refrigerant Designations 'Too Complicated'

By Frank J. Versagi

MOSCOW, USSR — The ASRE system for designating refrigerants is complicated and too cumbersome for practical use, according to an article appearing in the Russian refrigeration journal, *Kholodilnaya Tekhnika*.

Pointing out that the nomenclature developed by the American Society of Refrigerating Engineers introduces

"arbitrary designations," the article by Prof. R. Plank goes on to propose a "scientifically grounded nomenclature for halogenated refrigerants that is more precise and easier to remember." The proposal was developed by a study committee ("commission 3") of the International Institute of Refrigeration.  
(Concluded on Page 57, Col. 4)

## Servicing Ohio Bar Refrigeration Units Protested

the control board charged, "breweries and beer distributors are:

"Sending their employees to permit holders' places of business to perform service on compressed air, refrigeration, and draft beer equipment at no charge to the permit holder.

"Selling to the permit holders, equipment such as bars, backbars, stools, tables, bottle coolers, walk-in coolers, and draft beer equipment at prices less than the wholesale cost of the equipment to equipment dealers.

"In order to get their beer in an establishment on an exclu-

sive basis, some breweries and distributors will install free of any cost to the permit holder, tap boxes, and all equipment necessary to dispense draft beer."

The letter added that some companies, with an eye to an increase in volume of equipment and service business, have entered into a mutual agreement with breweries and distributors.

"We feel that this is an unfair practice," the letter said. "Our opinion is that if a permit holder should require service or equipment of any kind, he should contact his service com-  
(Concluded on Page 6, Col. 5)

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## Elects Petrone New President of Group

HOT SPRINGS, Va.—Out of the Air-Conditioning & Refrigeration Institute's meeting here last week came these major developments:

Plans for an industry-wide market development program for residential air conditioning, known as "Project SMAC" (Sell more air conditioning).

A certification program for room air conditioners to bulwark the present ARI capacity rating program, starting with 1959 models.

Reported resignation from the Room Air Conditioner Section of six major manufacturers, said to represent more than 50% of the room air conditioner business, presumably to join the new room air conditioner section of the National Electrical Manufacturers Association.

A certification program for unitary air conditioners is ready to go into effect as soon as producers of 75% of total unitary equipment sign up to participate. Enough signatures are expected by the end of June so new equipment after Aug. 1 will be eligible for certification.

Election of Don V. Petrone, president of Typhoon Air Conditioning Co., Div. of Hupp  
(Concluded on Page 57, Col. 1)



DON V. PETRONE

## Carrier Unveils Expanded Heating, Cooling Lines

SYRACUSE, N. Y.—An expanded line of "Weathermaker" heating and cooling products, featuring new oil and gas-fired furnaces and a wider range of air conditioning sizes, was introduced by Carrier Corp. at 11 distributor meetings recently held across the country.

Carrier unveiled 12 new gas-fired furnaces and 16 oil-fired models, all with increased air handling capacities for air conditioning.

The gas-fired Weathermakers, available in upflow and downflow models, have outputs ranging from 75,000 to 185,000 B.t.u., the company said. The oil-fired furnaces, in upflow, downflow, horizontal, and low-boy models, have capacities from 84,000 to 140,000. The distributors were instructed that fan motors no longer have to be changed when cooling is added.

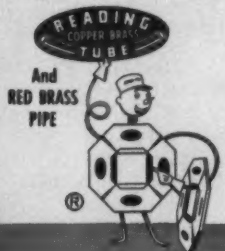
Three new condensing sec-  
(Concluded on Page 6, Col. 4)



Make Your **FIRST CHOICE**

# READING COPPER TUBING

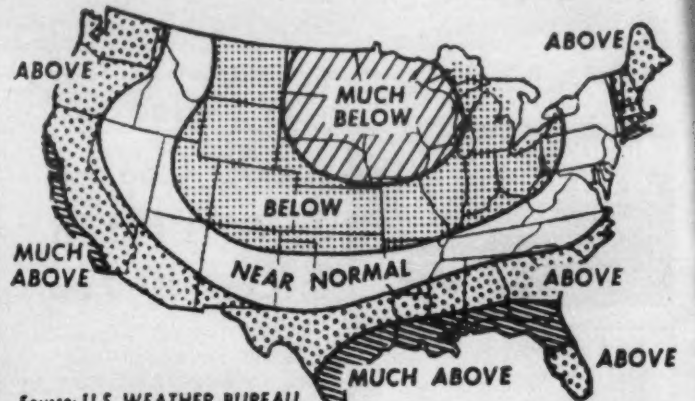
Made by  
Copper Tube SPECIALISTS



**SECOND to NONE**  
for Refrigeration &  
Air Conditioning Equipment

**READING TUBE CORPORATION**  
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WORKS: READING, PA.

## May Weather Outlook Termed 'Above Normal' In Far West, Deep-South



Source: U.S. WEATHER BUREAU

WASHINGTON, D. C.—In its 30-day outlook for May, the U. S. Weather Bureau said above normal temperatures are indicated in West Coast, Gulf,

and South Atlantic states, as well as in New England.

The forecast calls for temperatures to average below seasonal normals over the northern half of the nation lying between the Rockies and Appalachians.

In unspecified areas, near normal temperatures are anticipated. Large week-to-week fluctuations are indicated over most areas, the bureau stated.

Precipitation is expected to equal or exceed seasonal normals over most sections of the nation.

## NAPC Conclave To Hear '5 Big Names' June 30

WASHINGTON, D. C.—Five big names in the plumbing, heating, and cooling industry are scheduled to address the National Association of Plumbing Contractors 76th annual convention in Los Angeles June 30 to July 3.

The five are Charles L. Walling, president of the Refrigeration & Air Conditioning Contractors Association; Peter T. Schoemann, general president of the United Association of Plumbers and Pipefitters, AFL-CIO; John H. White, president and director of the Better Heating-Cooling Council; Norman Wicks, director of Plumbing-Heating-Cooling Information Bureau; and Horace E. Wetzell, vice president of the Mechanical Contractors Association of America.

## To Sept. 1

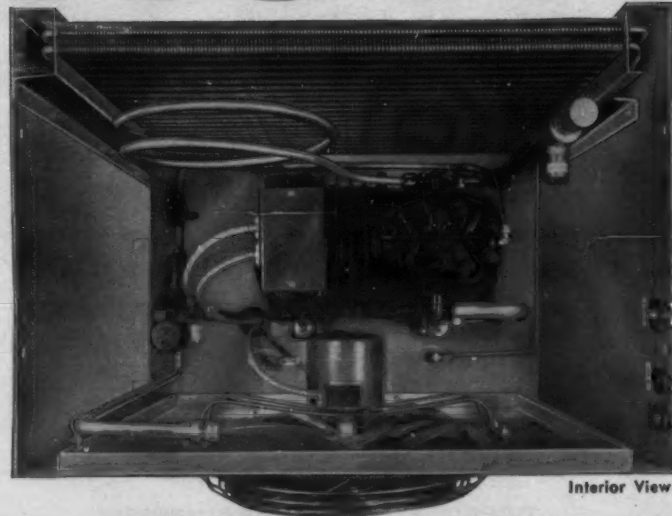
## U. S. Extends Deadline for Building Trades To Halt Closed-Shop Hiring

WASHINGTON, D. C.—A three-month extension of the deadline for building and construction trade unions to end illegal closed-shop hiring practices or face stiff fines has been announced by the government.

New deadline is Sept. 1. Unions were reported to have requested the extension to negotiate contract changes with employers. The closed shop, or any similar arrangements for hiring only union members, is illegal under the Taft-Harley law.

The National Labor Relations Board has pronounced a stiffer penalty for illegal hiring arrangements. It decided to make employers and unions jointly liable to refund to workers all dues and assessments collected under the arrangement.

# new!



Interior View

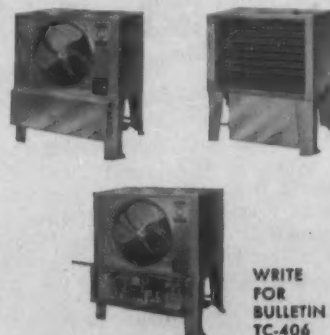
# new!

**KRAMER**

## THERMOBANK COMPRESSOR

### FACTORY PACKAGED at LOW COST!

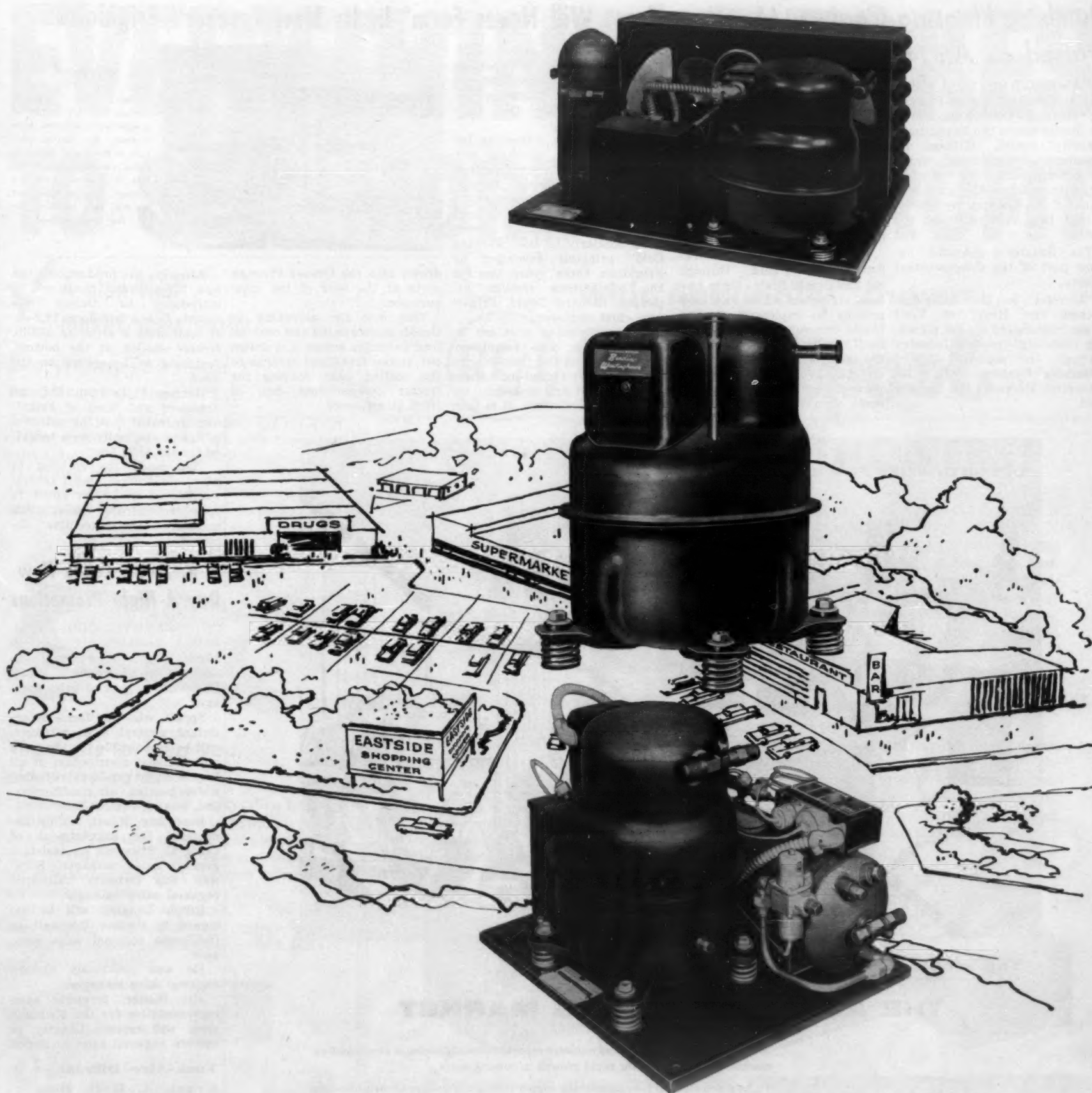
Kramer's new THERMOBANK COMPRESSOR overcomes the problems and uncertainties in field assembly of low temperature refrigeration systems. It's the only factory-assembled-and-tested automatic defrost system and includes a hermetic compressor, THERMOBANK re-evaporator and all controls. It arrives on the job ready to operate. Only simple connection to the Kramer evaporator is required and nearly all adjustments are eliminated. THERMOBANK COMPRESSOR uses an extra large air-cooled condenser and a high efficiency low temperature compressor—possible only with THERMOBANK—for maximum capacity at lowest cost. Tamper-proof aluminum case provides easy access to all components and maximum installation adaptability in any unconfined area. Units available on request for outdoor installation are designed for automatic trouble-free operation for any outside temperature.



WRITE  
FOR  
BULLETIN  
TC-406

**KRAMER TRENTON CO. • Trenton 5, N.J.**

44 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER



## FIRST FULL HERMETICS IN NEW SIZES AVAILABLE FOR 3-PHASE

Now, 1, 1½, and 2 h.p. compressors and condensing units designed for 3-phase, 208-220 volt, are ready for your installations in the new shopping centers.

Another Bendix-Westinghouse "first"—we recognized the need for the low-price advantages of the full hermetics and are supplying these units today wherever 3-phase circuits are in use.

These full hermetic, 3-phase units in the 1 to 2 h.p. range incorporate all the features that are building a solid reputation for Bendix-Westinghouse. They are quiet and efficient—dependable and trouble free.

If you haven't gotten the Bendix-Westinghouse compressor story, give us a chance to lay this remarkable story in front of you. It's a report of

nearly 200 satisfied customers in less than two years, many of whom report fewer line rejects and field returns—a decided cost saving to them.

You owe it to your company to test and try Bendix-Westinghouse cost saving compressors. A phone call will get samples on the way to you promptly. Just telephone HArrison 4-6471, Evansville, Indiana.

# **Bendix-Westinghouse**

EVANSVILLE, IND.

A Division of Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio—Export Sales: Bendix International, 305 E. 42nd St., New York 17, N. Y.



## Plumbing-Heating-Cooling Month Praised as Anti-Recession Idea

WASHINGTON, D. C.—On May 1—the first day of Plumbing-Heating-Cooling Month—the Senate heard the Republican minority leader, William F. Knowland of California, praise the p-h-c industry for "A campaign to quicken the economic pulse of the country by stimulating the modernization of homes."

The Senator's remarks became part of the *Congressional Record*.

"I refer to the campaign 'Renew the Heart of Your Home,' sponsored by the plumbing-heating-cooling industry through the medium of the Plumbing-Heating-Cooling Information Bureau," the Senator said.

"I commend the officers and directors of the Plumbing-Heating-Cooling Information Bureau and the members of the industry throughout the United States," Knowland added. "I compliment them on their enterprise in organizing a joint effort which cannot help but result in stimulation of employment at all levels."

In summing up his remarks, Sen. Knowland said: "throughout the United States there have been organized active local committees to implement the national campaign. It is for these local committees as well as for the national campaign that I respectfully urge the fullest support of our citizens, of government officials, and the press."

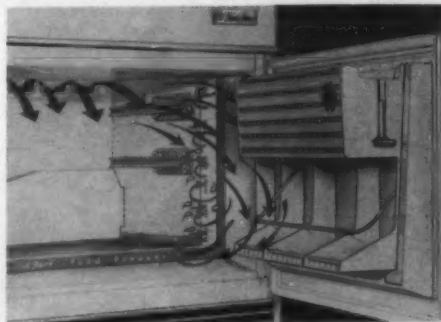
## 'Frost Will Never Form' In Its New Freezer—Frigidaire

DAYTON — A refrigerator-freezer featuring a freezing compartment in which frost will never form was announced recently by Frigidaire Div., General Motors Corp.

It never needs defrosting because it never develops any frost, claims Harlow Curtice, president of General Motors, who made the announcement.

The system in the freezer compartment operates somewhat similarly to the "Flowing Cold" principle developed by Frigidaire three years ago for the refrigerator section, explained Richard Gould, Frigidaire chief engineer.

Sub-zero cooling coils are located outside and completely separated from the freezer compartment. Air forced over these coils is dried and cooled to below zero temperature. It is then



THIS SHOWS how Frigidaire's new "Frost-Proof" freezer works. Sub-zero cooling coils are located in compartment separate from freezer. Air forced over coils is dried and chilled to below zero temperature before it is drawn into the freezer through ports on the top, rear, as shown by the large arrows.

drawn into the freezer through ports at the rear of the compartment.

This dry air, according to Gould, flows around and over all food packages before it is drawn out at the front and returns to the cooling coils, leaving the freezer compartment free of frost at all times.

Already in production, the new "Frost-Proof" model will be introduced to dealers this month. It is a two-door, 14.2-cu. ft. unit with a separate 133-lb. freezer section at the bottom, featuring an ice-ejector on the door.

Herman F. Lehman, GM vice president and head of Frigidaire, revealed that the patented unit had originally been targeted for the 1959 line.

"We made the decision to move production ahead several months in an all-out effort to spur refrigerator sales this summer," the executive declared.

## F. R. Spratt Leads New Day & Night Promotions

LA PUENTE, Calif.—W. J. Bailey, president of Day & Night Mfg. Co., recently announced the promotion of Frank R. Spratt to general sales manager.

Spratt, who was formerly assistant general sales manager, will be responsible for the sales and national distribution of all Day & Night products including water heating, air conditioning, and heating equipment.

Replacing Spratt, Bailey announced the appointment of Craig C. Stirewalt as assistant general sales manager. Stirewalt was formerly California regional sales manager.

Ralph Langley will be assigned to replace Stirewalt as California regional sales manager.

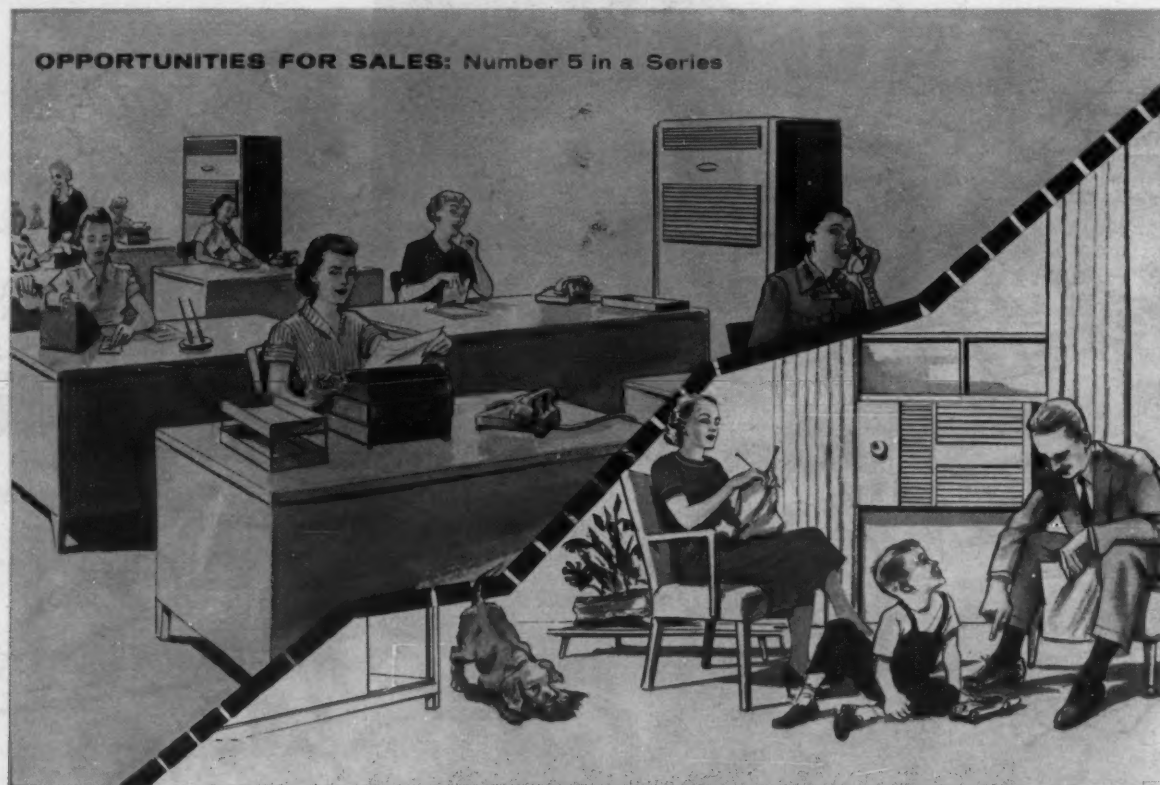
He was previously eastern regional sales manager.

Jim Buster, formerly sales representative for the Michigan area, will replace Langley as eastern regional sales manager.

## Tuck-Aire Official, Frank J. Hall, Dies

SAN FRANCISCO—Frank J. Hall, purchasing agent for Tuck-Aire Furnace Co., San Francisco manufacturing plant, since 1936, toppled over at work recently and died a few hours later in a hospital.

Hall was 72. He is succeeded by James Sime who joined Tuck-Aire last year in the purchasing department.



The Wholesaler and

## THE AIR CONDITIONING MARKET

According to government and industry reports air conditioning is an expanding market—one that's in for rapid growth in coming years.

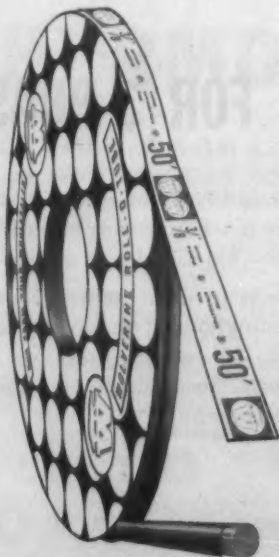
To help you step up your sales of the copper tubing required in air conditioning installations, Wolverine Tube has incorporated many special features into its copper refrigeration tube.

By packaging its refrigeration tube in the round, Wolverine Roll-O-Tube® carton, Wolverine provides your customers with real time-saving benefits.

They can use the Roll-O-Tube carton as a work-saving reel, carry it easily by its convenient center hole, identify its contents at a glance (it's color coded, too) and use the carton as the perfect storage spot for unused tube.

To assure them of clean and dry tubing, Wolverine seals both ends with a reusable plastic plug. The seal keeps out moisture and dirt, eliminates tube wastage and threads easily through partitions because it is the same O.D. as the tube.

Next time a customer talks about an air conditioning job tell him about these exclusive Wolverine features. It will help him—and help your sales. Write, too, for a copy of our Refrigeration Tube Catalog.



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Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA  
SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPT. 13 E. 40TH ST., NEW YORK 15, N.Y.

INTERNATIONAL GROUP of air handling people now doing business in 28 countries desires to contact reputable American manufacturer of 1/2, 3/4, and 1 Ton package window units for export into Europe. Credit references supplied and expected.

Write BOX A6022,  
Air Conditioning &  
Refrigeration News



# EVERYTHING IT TAKES TO SELL MORE AT A PROFIT

✓ A plan that  
makes sales easier

Everything you need  
to attract customers...

A complete package of sales aids . . . big, illustrated *handout pieces* . . . a 4-piece mailing campaign . . . attractive *window banner* . . . an exciting *floor display* . . . and a "Sell by Phone" booklet that gives you full instructions on using this fast, profitable sales technique.



The tools to help you  
close the sale...

Complete sales training and presentation booklet tells your salesmen how to approach the customer . . . what to say during the presentation . . . and provides a fast, easy cost calculator so salesmen can make accurate estimates without long training.

Then, for that final sales push . . . you can offer a special thermostat that controls both heating and cooling automatically for both night and day temperatures.



An exclusive way to  
contact thousands of  
prospects at no charge...

Exclusive, builder's display plan provides financing for you to install RCA WHIRLPOOL air conditioners in model homes put up by builders in your area. It costs you nothing and thousands of prime prospects see how RCA WHIRLPOOL central air conditioning systems operate in modern homes.

Use of trademarks and RCA authorized by trademark owner Radio Corporation of America

with nationally known



## Whirlpool

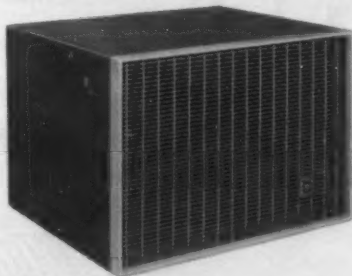
### AIR CONDITIONERS!

With over 500,000 U.S. families already enjoying central air conditioning, the question is no longer, "what are customers waiting for?" . . . the question is, "what are *you* waiting for?" The market is ready, the profits are waiting, and now — with new RCA WHIRLPOOL air conditioners — you can have everything it takes to get into the central air conditioning business. You have a known and accepted brand name with a reputation for high quality and dependability . . . you have a powerful sales plan . . . a new, exclusive, simplified installation package . . . and the most liberal financing ever offered. Get all the facts now to put you into this new, ready market for RCA WHIRLPOOL air conditioners where profits are unlimited! Tear out and mail the coupon below, today!



A complete line

Self-contained unit (combining both a refrigeration unit and coil-blower in one) in 2-horsepower capacity. Ideal size for homes, small stores, offices. Extra easy installation . . . in an attic, basement, garage, car port.



Two-unit system . . . separate refrigeration unit may be installed anywhere, even outdoors — the cabinet is impervious to weather. Compact coil-blower unit installs inside, fits even small crawl space. Capacities range from 2 to 5 horsepower, offering a selection of models to meet most every air conditioning need.



As little as  
8 hours to install

. . . with exclusive, Pre-Fab duct system.

Every possible job has been done at the factory to make installation fast and easy. Ducts are pre-cut into easy-to-handle sections . . . they're insulated and ready to fit together . . . ceiling or baseboard diffusers are designed to practically snap in place. With just 2 men on the job, a complete RCA WHIRLPOOL air conditioning system can be installed in an average home in 8 hours. Installation is even simpler in homes where existing heating ducts can be used.

MAIL THIS COUPON NOW  
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SALES MANAGER, AIR CONDITIONING DIVISION  
WHIRLPOOL CORPORATION, Box ACN-5  
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I am interested in knowing more about  
RCA WHIRLPOOL central air conditioning systems. Please send me complete information.

NAME \_\_\_\_\_  
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RCA WHIRLPOOL Home Appliances  
Products of WHIRLPOOL CORPORATION St. Joseph, Michigan

**Join up!...it's easier to sell RCA WHIRLPOOL than sell against it!**



## MCA, NAPC Merger Plan--

(Concluded from Page 1, Col. 4) problems that may be created by such a consolidation, to the end that completed plans for a consolidation may be submitted to the respective conventions of the two organizations in 1959.

The committees recognized that fundamental changes have taken place in the industries in the past 20 years, with installations in plumbing, heating and piping, and air conditioning now being made increasingly increasing instances by the same business units.

**Operating Costs of Residential Air Conditioning and What This Means to Dealers and Installers.** By R. A. Gonzalez—25¢ each.

Get your copy

Mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

The group also noted that more than half of the members of the Mechanical Contractors Association of America, Inc. are members of the National Association of Plumbing Contractors and that it was the desire of companies that belong to both organizations "to establish a strong, unified voice . . . that can help all units, large and small to solve problems relating to their individual operations in these areas."

Attending the meeting and representing NAPC were: Wilbur S. Hokom, Los Angeles, president; John M. Rhoades, Sarasota, Fla., 1st vice president; Irvin L. Rechkemmer, Canton, Ohio, 2nd vice president; Frank C. Schilling, Los Angeles, secretary; and Jerome O. Hendrickson, executive secretary.

Representing MCAA were:

Jos. H. Spitzley, Detroit, president; Horace E. Wetzell, Cleveland, vice president; William P. Scott, Jr., Oakland, Calif., treasurer; Jos. S. Kearney, Chicago, director; Leon L. Munier, New York City, director; and Lloyd B. Gruman, Jr., New York City, executive secretary.

Spitzley later told the NEWS that the way was left open for the Refrigeration & Air Conditioning Contractors Association to become part of the new organization, if and when it is formed.

He noted that RACCA won't hold its convention until November, it was thought better to go ahead now to prepare the myriad details that such a merger movement naturally involves.

Spitzley said that MCAA and NAPC are planning to hold their 1959 conventions concurrently so that, if the merger is approved, it could take place immediately.



A SERIES of 11 distributor meetings held by Carrier Corp. served as the introduction of new lines of heating and air conditioning equipment. Explaining a new gas-fired furnace at the New York City meeting was Thomas Welch (pointing at unit), New York district manager. Frank Teofani (l.), general sales manager of Carleton-Stuart distributor, Roy Smiles, eastern regional manager, and George Long (r.), director of marketing, look on.

## Carrier Heating, Cooling Lines--

(Concluded from Page 1, Col. 5)

tions were introduced allowing the distributors to offer a complete range of capacities from 2 up to 10 tons, it was pointed out. Compactness of the equipment was demonstrated by the 3-ton models that are 25% smaller than previous units of

the same capacity, according to Carrier. The other new models are in 7½ and 10-ton sizes for commercial installation, it was added.

Combined with Carrier's new ceiling or floor mounted fan coil units, the condensing sections can be installed outside to save floor space.

A new Universal Weathermaker with a full 2-ton capacity is being offered by Carrier for the residential market and smaller shops and offices, it was also announced. Relative low initial cost and easy adaptability to prefabricated ductwork are among sales features, according to the company.

A new air handling unit, the Summer Weathermaker, "is a versatile space saver that can be horizontally mounted on the ceiling or vertically mounted on the floor," the announcement said. "It is designed to operate without outside condensing units and is available in 7½ and 10-ton sizes."

Rounding out the new Carrier Weathermaker line are water-cooled, heavy-duty air conditioning packages in 25 and 30-ton sizes for stores, offices, and industrial plants.

## 'Giveaway'--

(Concluded from Page 1, Col. 4)

pany or equipment supplier and pay for the service or equipment at prevailing trade prices.

"The breweries and distributors of beer should not enter into the picture regarding service or equipment whatsoever.

"We further feel that they should promote their products on their merit and not on how much they can give the permit holder.

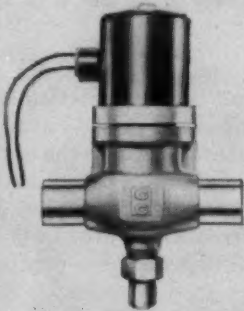
"As responsible business organizations we are bringing these violations to the attention of the board without naming the offenders, knowing that the board will notify the permit holders, the breweries, and the beer distributors of this complaint of violations and thereby correct the situation without hurting anyone.

"But we will be watchful of any further violations and will not hesitate to make it known to the board."

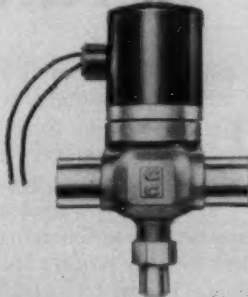
A spokesman for the protesting dealers said, "It is our hope that with the bringing to light the facts stated in the letter . . . we can stop this infringement on the refrigeration industry by the beer distributors."

He said that to date, the board of liquor control has not replied to the letter. Neither have any breweries or beer distributors.

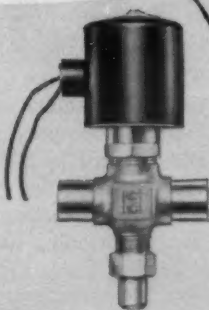
**Model 274**  
— Orifice 1";  
Connections 1¼" N.P.T.;  
1½" and 1¾" O.D.F.,  
1¾" and 1½" O.D.M.



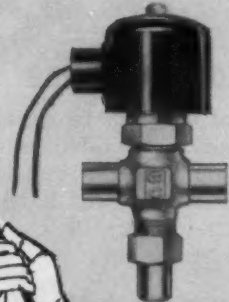
**Model 273**  
— Orifice ¾";  
Connections 1" N.P.T.,  
1½" O.D.F. and  
1¾" O.D.M.



**Model 272**  
— Orifice ½";  
Connections ¾" N.P.T.,  
¾" O.D.F. and  
1½" O.D.M.



**Model 271**  
— Orifice ½";  
Connections ¾" and  
½" N.P.T., ¾" O.D.F.,  
¾" O.D.M.



Step right up for a closer look!

## 4 New Solenoid Valves by

Now you can choose from a complete line of dependable models to satisfy any solenoid application in the refrigeration field

Available in a full range of orifice and connection sizes with capacities up to 60 tons, these versatile solenoid valves are designed for both liquid and suction line refrigerant (for Refrigerants 500, 40, 12 and 22) plus hot gas defrost installations and for controlling water-flow.

Cast bronze construction . . . moisture proof coil . . . easy inspection of internal parts after installation. Pilot operation gives increased capacity. Valves are over-powered to lift against rated maximum operating pressure differential at 85% of rated voltage. Available with pipe thread connections or you can solder these compact valves into lines quickly and easily, even in difficult positions. Manufactured in accordance with Underwriters' Laboratory Specifications.

These new solenoid valves complement the largest and most complete lines of expansion valves, water regulating valves, pressure regulating valves, filters and driers supplied by any one manufacturer in the industry.



**CONTROLS COMPANY OF AMERICA**

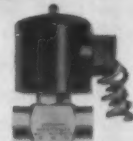
Manufacturers of A-P CONTROLS

2450 N. 32nd St. • MILWAUKEE 10, WIS.  
COOKSVILLE, Ontario • NIJMEGEN, Holland  
Controls that make modern living possible

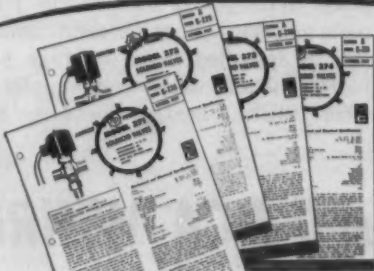
Plus these standard industry favorites



**MODEL 73**—Use with refrigerants, air, water and oil. Available in 3 orifice sizes and 4 body sizes.



**MODEL 67**—Available in 2 types. Metal-to-metal seat and soft resilient seat. 3/32" orifice.



Write for engineering bulletins  
These bulletins give complete specs on new A-P solenoid valves.



## Fort Worth Installations --

(Concluded from Page 1, Col. 2) senting 9,319.5 tons or 12,712.5 hp. Biggest year for tonnage, though, was 1955, when 963 installations totaled 10,196.5 tons, according to these figures.

Growth of residential air conditioning is dramatically shown in the utility's figures, as indicated in the accompanying table.

Residential			
Year	No.	Tons	Tons per Job
1948	55	350.0	6.4
1949	55	381.5	6.9
1950	94	535.5	5.7
1951	139	929.5	6.7
1952	226	1,379.0	6.1
1953	326	1,566.0	4.8
1954	396	2,019.0	5.1
1955	710	3,628.5	5.1
1956	701	3,278.0	4.7
1957	1,097	4,236.0	3.9

Along with the increase in number of installations, it is interesting to note the drop in average size of residential installation—from a peak of 6.9 tons in 1949 to the low of 3.9 tons in 1957.

(Incidentally, number of residential installations listed in the Texas Electric Service Co. summary is less than totals shown in the annual detailed surveys made in Fort Worth by AIR CONDITIONING & REFRIGERATION NEWS, latest of which appeared in the April 28, 1958, issue.

(The NEWS data covers a slightly larger area, and includes gas absorption and engine-driven jobs plus complete figures from some contractors who say they don't report all their residential installations to the utility.)

Commercial applications of air conditioning have shown a steady growth in Fort Worth over the past 10 years, although the gains have not been as spectacular as in residential, the Texas Electric Service summary shows.

Commercial			
Year	No.	Tons	Tons per Job
1948	146	3,516.0	24.1
1949	160	3,792.5	23.7
1950	193	3,653.5	18.9
1951	205	6,264.5	30.6
1952	211	6,260.0	29.7
1953	226	5,957.5	26.4
1954	201	4,789.0	23.8
1955	247	6,112.0	24.7
1956	233	4,423.5	19.0
1957	251	4,448.0	17.7

As the commercial tabulation indicates, 1957 was the biggest year in terms of number of installations with 251, but 1951 saw the most tonnage installed with 205 jobs totaling 6,264.5 tons.

Biggest year for both industrial and government-municipal installations was 1953, according to the utility's figures. That year saw 19 jobs in each of these categories go in, with the industrial systems totaling 1,813 tons and the government and municipal jobs accounting for 304.5 tons.

Yearly breakdown of industrial installations in Fort Worth

**SEND FOR REPRINTS**  
Product Knowledge, Protective Maintenance, Trouble-Shooting, Adjustment, Repair of Electric Motors.  
Only 40¢ each.  
For your copy, clip this ad and mail with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

is shown in the accompanying table, which starts with 1949, there having been no jobs in this classification during 1948.

Industrial			
Year	No.	Tons	Tons per Job
1949	2	13.0	6.5
1950	3	295.0	98.3
1951	2	185.0	92.5
1952	3	32.0	10.7
1953	19	1,813.0	95.4
1954	8	109.5	13.7
1955	6	456.0	76.0
1956	2	405.0	202.5
1957	12	615.5	51.3

The 10-year total of 46 government and municipal instal-

lations is detailed in another table.

Government & Municipal			
Year	No.	Tons	Tons per Job
1948	6	77.5	12.9
1949	3	118.0	39.3
1950	1	25.0	25.0
1951	11	172.5	15.7
1952	2	65.0	32.5
1953	19	304.5	16.0
1954	....	....	....
1955	....	....	....
1956	2	15.0	7.5
1957	2	20.0	10.0

### To Cool State Bldg.

RICHMOND, Va.—Work has begun on a \$310,000 air conditioning project for the old State Office building.

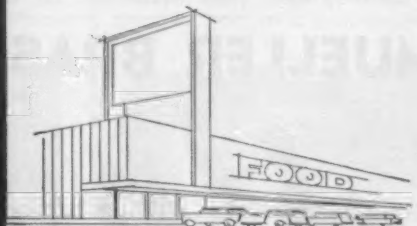
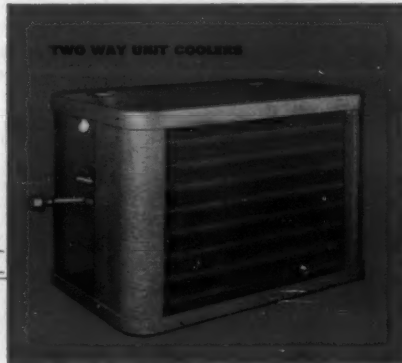
## Hotpoint To Complete Elk Grove Plant Construction But Changes Mfg. Plans

CHICAGO—Construction of a new manufacturing facility originally scheduled to manufacture compressors for refrigerators will be completed this summer despite changing plans for its use, John C. Sharp, president of Hotpoint Co., Div. of General Electric Co., announced here recently.

Improved manufacturing processes of the G-E compressor plant in Louisville, Ky. now enable that facility to meet the needs of both General Electric and Hotpoint refrigerator pro-

duction, he further explained. Compressors manufactured in Louisville are standard items and have previously been used in both types of refrigerators. Production efficiency at the plant is now such that it can equal its planned output plus that of the new Elk Grove, Ill. facility, it was stated.

The decision has not yet been made as to what product will be manufactured at the Elk Grove plant, although several alternatives are currently being studied.



## MEET ALL REFRIGERATION NEEDS

with

# McQuay

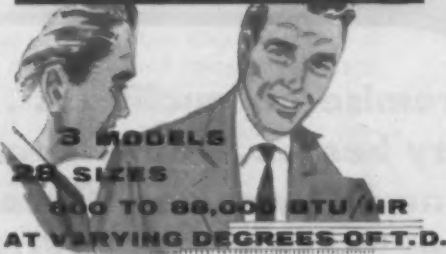
## UNIT COOLERS



**TWO WAY UNIT COOLERS**  
Wide range of capacities in five sizes. Designed for beverage coolers, back bars, reach-ins and other refrigerated fixtures. Units may be wall or ceiling mounted. Listed by Underwriters' Laboratories.

**RADIAL UNIT COOLERS**  
Eight sizes to fit the requirements of walk-in coolers and cold storage rooms. Styled for minimum height as required in low ceiling applications. When used in meat cutting rooms, units can be equipped with cleanable filters. Listed by Underwriters' Laboratories.

**PACEMAKER UNIT COOLERS**  
Ten compact sizes for any product cooling application. Adjustable louvers provide directed air circulation. Listed by Underwriters' Laboratories.



McQuay Unit Coolers enable you to meet all your refrigeration needs. And, McQuay Unit Coolers are better and they perform better because McQuay coils are superior in so many ways.

Only McQuay gives you *ripple fins* for strength, maximum heat transfer, wide uniform and *solid cylindrical fin collars* butted against each other to evenly space fins and to provide a *permanent bond* between tube and fin. The expansion of the copper tube against a solid continuous aluminum collar eliminates loose fins and actually forms a tube within a tube. This completely covers the exposed copper and eliminates the hazard of electrolytic deterioration.

For best results, use the best. See the McQuay wholesaler in or near your city, or write McQuay, Inc., 1607 Broadway St. N. E., Minneapolis 13, Minnesota.

TV Means Quality



AIR CONDITIONING  
HEATING  
REFRIGERATION



Promoted as Attic Unit

# Vornado Central Units Put Almost Everywhere Else; Find Out 'Hard Way' Home Cooling Can't Be Sold 'Over Counter'

By George M. Hanning

DETROIT — Though introduced and promoted as an attic air conditioner, 70% of applications of Vornado's 2 and 3½-hp. central units are not in attics, Charles Fisher, national sales manager for the commercial products division of O. A. Sutton Corp., reported here recently.

Speaking to dealers attending a sales meeting sponsored by Air-Con, Inc., Detroit area distributor for Vornado products, Fisher said that most of the units have been installed in basements, through the wall, in crawl spaces, or on roof tops.

He declared that Sutton has "found out the hard way" from

its two year experience in the residential air conditioning field that the central air conditioner is not an appliance to be sold over the counter by appliance dealers and it is not a "do it yourself" job. A competent installer is required.

Fisher told the dealers—largely heating and sheet metal contractors—that Sutton was not pushing its pre-fabricated duct.

## 'Selling Cooling, Not Ductwork'

"The kit is available for those who want it," he declared, "but we are selling air conditioning equipment, not ducts."

He described Sutton's new "Rent-A-Vornado" central air conditioner plan to help dealers flush out good commercial prospects.

## Rental Plan Is Sales Tool

While the plan is a legitimate rental offer that will be attractive to small businessmen, Fisher pointed out, it is designed mainly as a sales tool.

A direct mail brochure tells the businessman that "all the plan requires is that you have an established business and an approved credit rating."

"You make no down payment, there is no chattel mortgage, no cash outlay no notes payable, and your financial statement

remains wholly unencumbered. "Monthly payments are based on 1/8% of the total cost. Unit and installation price is the same as if paid for by cash. Interest and finance charges are the only extras."

The prospect is given the option to buy if he so desires.

The leasing plan is handled through National Equipment Rental, Ltd. of Floral Park, Long Island, N. Y. Once the customer signs an acceptance of the lease, the dealer gets his money within 48 to 60 hours, Fisher said.

While there is no gimmick to the plan, he told the dealers, there is a requirement that will keep a number of small businessmen from qualifying for a lease.

They must have a credit rating of C+2 or better or they must furnish a profit and loss statement.

If the prospect can't qualify,

Fisher suggested, try getting a FHA Title 1 (Improvement) loan or go with him to his banker and help arrange a three year loan to purchase the equipment. Fisher said that Vornado units have FHA acceptance.

## 'Use the User'

For residential sales Fisher offered a "use the user" device.

The customer is offered \$25 for each name submitted by her that results in a sale before Aug. 31.

"Make the customer come to your store to get her money," Fisher suggested. "This gives her a chance to spend it before she leaves."

Of the \$25 bonus offered, the dealer would pay \$15 and the distributor and manufacturer \$5 each.

## Existing Homes

## Record High Set During March In Home Loan Insurance Applications

WASHINGTON, D. C. — Applications for Federal Housing Administration insurance during March set a new record for existing homes and was the largest for any month since August, 1955 for new homes, Norman P. Mason, FHA commissioner announced recently.

The 24,968 applications for new home insurance was up 21% over February and 54% over March, 1957.

The 37,935 applications for insured financing of existing homes was nearly a third over February and more than double March last year.

In addition, the GI home loan program, just extended for World War II veterans for two years beyond its previous expiration date this July, picked up in March over the February low. U.S. housing officials said the increase was due to anticipation of the new housing law which became effective April 1.

Veterans Administration said appraisal requests on proposed structures, thought to be an indicator of the coming pace of home building, shot up to 8,406 during March, a rise of 58.6% over February. Appraisal requests on existing structures in March showed a rise from 2,221 in February to 3,095. GI housing starts also went up, totaling 3,092, up almost 12% from the 2,764 in February.

## Radiant Ceiling Heats, Cools Outdoor Patio

OKLAHOMA CITY — Year-round air conditioning for his outdoor patio has been installed here by Harold C. Parker.

Heating and cooling is provided by a radiant ceiling. Hot and cold water is piped behind a conductor ceiling consisting of perforated metal panels clipped onto the coil system.

Parker, who distributes the system in the southwest, said he installed what he believes to be the first air conditioned patio in the world just to show that it could be done. With the same equipment he could cool and heat an eight-room house, he indicated.

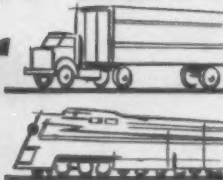
The system is manufactured by Burgess Manning Co. of Chicago.

MUELLER BRASS CO.

# Drymaster

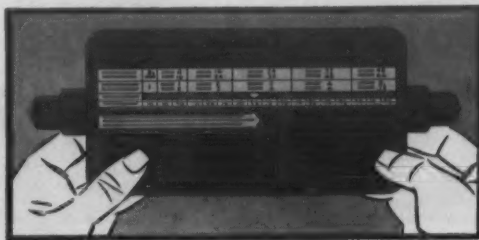
## FILTER-DRIERS

## are now available for immediate delivery!



we refused to compromise on quality . . . we wanted to give you only the very best . . . you'll be glad you waited . . . for this amazing new Drymaster—the only Filter-Drier with guaranteed "BALANCED PERFORMANCE"

This handy slide-guide is yours for the asking. It provides a quick, easy way to select the correct Drymaster Filter-Drier for every installation. Shows at a glance—the drying capacity, filtering area, flow ratings and over-all length. Write for your slide-guide today—or pick one up at your wholesaler's.



246

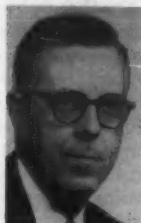
MUELLER BRASS CO.

PORT HURON 13, MICHIGAN



## Mueller Climatrol Ups Davidson and Schmidt

MILWAUKEE—Two executive appointments in the Mueller Climatrol sales organization have been announced by H. P. Mueller, Jr., executive vice president.



D. Davidson

Don Davidson, formerly field sales manager for Mueller, has been named manager of marketing, a new post. Richard B. Schmidt, formerly sales promotion manager, has been appointed sales manager for all Mueller Climatrol prod-



R. B. Schmidt

ucts, according to the firm. As manager of marketing, Davidson will direct the over-all sales and promotion operations of the company.

## Kramer Receives 'Unexpected Response' from Copy Contest; Decision on Winners Delayed

TRENTON, N. J.—The Pfaus-Finkle Advertising Agency here reports that response to the "Thermobank" copywriting contest sponsored by Kramer Trenton Co., has been far greater than anticipated.

In order to give each entry the careful consideration it deserves, the judging of the contest has required considerably more time than anticipated, the agency said. Announcement of the winners is expected to be made sometime within the next few weeks.

Authorized Kramer wholesalers participated in the con-

test by mailing contest entry blanks and information to their customers. The contest brochure showed the ad for which contestants wrote copy and explained the compressor advantages offered by Kramer Thermobank.

The contest winner will have his copy as well as his name in the Kramer advertisement, which will appear in all the leading national refrigeration publications, and he will also receive a color TV set.

## Cooling Dealer Opens

WAYCROSS, Ga. — A new enterprise for Waycross is Condaire, Inc., 628 Plant Ave., which features Bryant air conditioning and refrigeration equipment.

Co-owners of the firm are Eugene Crawford and Don R. Law, the latter of Albany, Ga., with Crawford in active charge as manager.

## SMI Show To Highlight Blast Freezer Which Freezes Purchases 'In Minutes'

CHICAGO — A blast freezer that will freeze a customer's fresh meat purchases rock hard in minutes will be a highlight of the Super Market Institute's 21st annual convention and exposition in Atlantic City, May 25-28.

A release from SMI envisions the shopper selecting her fresh cuts at the meat counter, then going about her other shopping in the store, and picking up her

purchase ready for the freezer before passing through the check-out.

Or, if she prefers, she can have the meat cooked in an electronic barbecue unit, which will also be on display at the exposition.

Another feature of this year's exposition will be architect's renderings of the supermarkets of today and tomorrow spotted at 15 locations around the show.

## Augusta Merchants Support Auditorium Cooling

AUGUSTA, Ga.—The Augusta Merchants Association is supporting a plan to air condition the Bell Auditorium here as "a very progressive step."

The plan, advanced by Councilman Willis Irvin, Jr., would involve the issuance of revenue

certificates to finance installation of a \$65,000 cooling system. The certificates would be redeemed through a 10-cent increase in the price of admission.

Irving has pointed out the air conditioning would put operation on a year-round basis.



## G-B DUCT DISTRIBUTORS

AMARILLO, Morrison Supply Co.  
ATLANTA, Reynolds Aluminum Supply Co.  
AUGUSTA, Ga., Noland Co.  
BALTIMORE, Leroy Insulation Co.  
BILLINGS, Mont., Big Horn Supply, Inc.  
BIRMINGHAM, Hall-Newsome Co.  
Hart-Greer, Inc.  
Shook & Fletcher Supply Co.  
BROOKLINE, Mass., Homans-Kohler, Inc.  
BUFFALO, Industrial Insulation Sales, Inc.  
CHARLESTON, Dunbar Metal & Supply Co., Inc.  
CHARLOTTE, N. C., Guy M. Beatty & Co.  
CHATTANOOGA, Guy M. Beatty & Co.  
CHICAGO, E. C. Carlson Co.  
CLEVELAND, The Miles Materials Co.  
COLUMBUS, Santeier Brothers  
CORPUS CHRISTI, Precision Insulation Co.  
DALLAS, Insulation Supply Co., Inc.  
Payne-Ladewig, Inc.  
DAVENPORT, Republic Electric Co.  
DECATUR, Ga., Lennox Industries  
DENVER, Gene Wright Lumber Co.  
DES MOINES, Iowa Asbestos Company, Inc.  
DETROIT, J. L. Johnston Co.  
FORT WORTH, The Bracken Company  
HOUSTON, Precision Insulation  
INDIANAPOLIS, Central Supply Company  
JACKSON, Miss., Paine Refrigeration & Supply Co.  
JACKSONVILLE, Florida Air Conditioners  
Southernair Distributors  
KANSAS CITY, Kelley Asbestos Products Co.  
LITTLE ROCK, Gunn Distributing Co., Inc.  
LOS ANGELES, Western Fibrous Glass Products Co.  
LOUISVILLE, General Insulation & Roofing Co.  
LUBBOCK, Tex., Morrison Supply Co.  
MIAMI, Crabtree Insulation Co.  
Fiber Duct Distributors  
MYRTLE BEACH, S. C., Air Conditioning Supply  
NEW HAVEN, Conn., Insulation Supply Co.  
NEW ORLEANS, Eagle Asbestos & Packing Co.  
NEW YORK, Eastern Steam Specialty Co.  
NORFOLK, Va., Automatic Equipment Sales Co.  
OMAHA, Cardinal Supply Co.  
ODESSA, Tex., Morrison Supply Co.  
PHILADELPHIA, John F. Scanlan, Inc.  
PHOENIX, Kircher Asbestos & Rubber Co.  
PITTSBURGH, Dravo Corporation  
RICHMOND, Automatic Equipment Sales Co., Inc.  
Reynolds Aluminum Supply Co.  
ROCKFORD, Ill., Mott Brothers  
ST. LOUIS, Hollander & Co., Inc.  
SALISBURY, Md., Automatic Equipment Sales Co., Inc.  
SALT LAKE CITY, Bulough Asbestos Supply Co.  
SAN ANTONIO, The Bracken Co.  
SAN FRANCISCO, Western Fibrous Glass Products Co.  
SEATTLE, Western Fibrous Glass Products Co.  
SHREVEPORT, La., Frith Sales Co.  
SOUTH BEND, Place & Co.  
SYRACUSE, Industrial Supply Co.  
TALLAHASSEE, Baker's, Inc.  
TAMPA, Eagle Roofing & Art Metal Works  
TULSA, Ball Distributing & Engineering Co.  
VANCOUVER, Fleck Bros., Ltd.  
WALDORF, Md., Automatic Equipment Sales Co., Inc.  
WASHINGTON, D. C., Walter E. Campbell Co.  
Wilson Supply Co., Inc.  
WINSTON-SALEM, N. C., Air Conditioning Supply

During the rush season just ahead, you'll

## INSTALL MORE JOBS, MAKE MORE MONEY with new G-B DUCT!

Don't miss the boat during the busy months that lie ahead—see your local distributor of new G-B Duct right away about the first prefabricated round glass fiber duct! Actual cost comparisons reveal that G-B Duct, compared with metal insulated ducts, can save you 22%-27% on application costs—and up to 50% in installation time!

Here's why: G-B Duct comes in one-piece 6-ft. sections, *ready-to-use*—no pre-assembly, no folding. With G-B Duct there are no longitudinal flaps or seams to be stapled and taped—no messy adhesives and no drying time. G-B Duct can easily be cut and fitted with a knife and the templates provided, and sheet metal collars and connections are readily available. Sizing is no problem because G-B Duct is made in the same nominal sizes as round sheet metal pipe and fittings.

For every heating, air conditioning or combination job, use G-B Duct—and you'll save time and money. And after installation, you'll have no worries about a "tight" job. Uniformly thick glass fiber walls provide positive thermal insulation and maximum sound absorption, while the continuous airtight plastic vapor barrier sleeve positively prevents condensation.

FOR NAME OF YOUR NEAREST SUPPLIER, SEE ADJOINING COLUMN

# GUSTIN-BACON

218 W. 10th St., Kansas City, Mo.

Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

Manufacturing Company





## Ladies Complain of Some Problems In Home Air Conditioning (2)

### Air Movement, Selecting Comfortable Temperatures, Noise Bother Them

LOS ANGELES — Women first question. "What about sleep conditions?" she asked.

"I like to sleep in a cold room. If you leave your windows closed in winter and if you close your heating registers, then you won't have any air moving."

Norris replied, "If you would run your blower on your air conditioning system constantly, you have that air motion. I think I am very right in saying that you must have air moving in the bedroom at all times. You don't need to have a breeze, but you don't want stagnant air."

"No, I like fresh air," commented Mrs. Bert.

Mrs. George Bert raised the

when they are installed, would be installed so the blower would run all of the time," Norris continued. "But all of the dealers don't install them that way."

#### 'Can't Run Heat, Cooling at Same Time'

Mrs. Bert was still puzzled. "There is heat and there is air conditioning. You can't run both at the same time. If you put the fan on continuously, you wouldn't heat at all, would you?"

"You would get heat when the thermostat says heat," Norris explained. "I don't know what arrangement of parts you might have, but it's perfectly simple for you to keep on the blower continuously."

"It's perfectly simple for your dealer to set your system so the

blower runs all of the time whether it is heating or air conditioning. You will have constant air circulation.

"In my home, the blower is never turned off in the 12 months of the year."

"That little deal that you hear," persisted Mrs. Bert. "That shouldn't run all the time? My husband thought it shouldn't be running all the time and I said, 'No, it is supposed to run.'"

"Normally they are not set to run all the time," Norris replied. "Normally the blower is adjusted so it will run all the time when you are cooling and part of the time when you are heating. I like to have it run all of the time when we are both heating and cooling."

"Can you have it set to do that?"

"It takes about 10 seconds to set the controls on the blower so it will run all of the time."

Later, Mrs. Edna Garvey of Altadena brought up the question again and proved a little difficult to convince.

#### 'Blower Running with Windows Open?'

"I keep my temperature at 72° F. all the time," she reported, "which I think is wonderful. But at night I turn it off and open the windows up. Should I keep that (blower) running day and night at 72° F.?"

"I would very much prefer it," Norris nodded, "because at night when the windows are open you get so much dirt. And you get noise and a very substantial amount of moisture."

"It costs quite a bit of money to dry that air up when you turn it back on in the morning. So you are in better shape if you will keep your windows closed and the air conditioning works 24 hours a day. You will sleep better."

"And the temperature at 72° F.?"

"If you prefer the temperature at 72° F., you can set the thermostat at 72 or 76. But put the thermostat where you are comfortable and forget it."

"No windows open?" Mrs. Garvey persisted.

"No windows open."

"No windows open just that wide?"

"You don't need it," Norris insisted. "Probably there is a little outside air pipe that comes in through the air conditioner that is pumping fresh outside air into your house constantly. You will get plenty of fresh air."

Trying to make everybody happy with the temperature was a puzzler.

Mrs. Lee Graff put it to Norris: "The housekeeper likes it very cold. My daughter likes it colder. Mr. Graff likes it warmer. How do we solve our problem?"

"Shut your vents a little bit more," someone from the audience suggested.

"That doesn't do it quite enough," Norris commented. "Your air is still in circulation and it tends to equalize."

"Very frankly, it is a difficult and expensive job to create a wide difference in temperature in one house. It could be done, although it would be very expensive if your housekeeper changes next year."

#### 'She Wouldn't Dare!'

"She wouldn't dare!" asserted Mrs. Graff.

Mrs. Bert admitted that she, too, lived in a house divided.

"The children sleep at night with the heat on full and the window closed, just the door open," she said. "I can't stand it."

"So it is difficult to get the right temperature for everyone in the house. I go along and turn it down and my husband comes along and pushes it back up. So the only way I can get it right is to tell them that the man said not to touch it."

"Normally, that is the best advice," Norris admitted.

"We have a gang of kids run-

(Concluded on next page)

## How successful dealers look for leads

**canvassing program** offer the advantage of personal contact... present a quick, clear picture of the homeowner's heating problems or inclinations toward cooling. Secret of success lies not only in who does it, but in how and when it's done.

### Better Business Guide #3

#### using the user

Tasteful quality gifts make a tempting incentive for past customers to volunteer names of new prospects. Through a special arrangement, Mueller Climatrol makes premiums like those at right available to the dealer at greatly reduced prices.



Industry statistics show that half the homes in this country do not have central heating, that less than 2% are centrally air conditioned. At the same time, research indicates that many homeowners are interested in modernizing their home comfort equipment.

Why, then, aren't customers beating down the heating and cooling dealer's door? Quite simply, people also want new automobiles, furniture, appliances — and can't resist the greater sales pressure behind these products. As many a successful dealer has found, if you want profitable modernization business, you must go after it!

#### How It's Done

The element most essential to suc-

cess is a planned prospecting program for uncovering leads. Among the most popular methods are these:

• **Direct mail** — Lets you concentrate your advertising on your own prospects. But programming — not just an occasional mailing — and personal follow-up are essential.

• **Canvassing** — Door-to-door and telephone canvassing programs reach a great number of prospects in quick succession, can be conducted by present or part-time help. Here too, coordinated planning and follow-up are extremely important.

• **Using the user** — Based on the experience that word-of-mouth advertising is a potent selling tool, this program puts past customers to work uncovering new ones.

#### Easy to Organize

Mueller Climatrol's wide selection of promotional aids includes everything you need to set any or all of these programs in motion. What's more, your Mueller Climatrol representative welcomes the chance to work with you in "tailoring" a program to your locality. Why not contact him today, or write...

**Mueller Climatrol**

2056 W. OKLAHOMA AVE., MILWAUKEE 1, WIS.

Western Zone: 1024 Westminister Avenue, Alhambra, California

Division of Worthington Corporation



(Concluded from preceding page) ning in and out from 105° F. outside to 74° F. in the house," an unidentified woman spoke up. "I would like to know if it hurts them at all, this change in temperature?"

"So far the medical profession has found that there has been no damage done from kids coming from outside to 74° F. inside at all," Norris stated.

"The most constructive research on this subject was done in Austin, Texas where they built 22 new houses that were air conditioned and 22 homes that were not. Families in about the same economic level were living in both sets of houses.

"The University of Texas then did a very exhaustive job of testing the physiological effects of air conditioning on the 22 families with air conditioning against the 22 families that were not air conditioned.

#### 'Health Better'

"They found that the health level of the families living in the air conditioned houses was much, much better than the non-conditioned homes. Doctor bills were less and epidemics less frequent among the people who were living in the 22 air conditioned houses.

"So all of this adds up to the fact that if you are cool and comfortable, you are much healthier. It is good for you. There is no damage at all as far as we know coming from warm to cool."

Mrs. Walter Mansfield complained that her unit was "a little bit noisy."

Mrs. Graff chimed in. "The new equipment in our unit was put in the house when it was built 2½ years ago. We have what I would call a small sub-basement with all of the units. That, of course, gives us a great deal of silence. But still there was a noise.

#### 'Contractor Put Silencer On'

"About six or eight months ago, the contractor had a silencer put on the equipment. I know what you are talking about when you talk about the noise, but now there is no problem at all with the noise."

"Do you know what he did?" asked Norris. "Did he put a fiberglass in the ductwork?"

"I don't know," she continued. "All I know is that it is a silencer and it worked."

Mrs. Robert Mosher of Encino reported that her outside condensing unit is noisy. "But we are willing to put up with it. So far, I have had very agreeable neighbors. Of course, they cook outside in the summer."

Norris suggested that some acoustical material would quiet it down.

Mrs. Sharp had a different complaint. "The air conditioning is beautiful," she said, "but with the furnace we have cold floors. I don't know what is wrong."

"Where are your registers?" Norris asked.

"Up high."

"There might be quite a simple solution if you would run the furnace blower more of the time," he urged. "It's when the blower is off the cold air builds up on the floor. When the blower starts the cold air goes across the floor.

"Of course it is easier to do

the job correctly with a perimeter type of system, but when the registers are high, we have to work a little harder.

Mrs. Mansfield said she built a new home last year and advised the others not to do what she did.

"We changed our builder at the last minute," she said. "He wasn't used to this new type of perimeter heating. We have cement floors and it is silent and quiet.

"But anyway, they were almost ready to pour the cement. They hadn't put in the big vents and the great big pipes. Of course the work had to be done over. But we have been most comfortable.

"I would say if we had to do it over again, I would put more insulation in the walls and overhang."

Mrs. Rod Hansen complained, "Our compressor is sitting in the garage because the city made us move it. We had to

have a 5-ft. clearance between our property line and the house.

"We fudged a little and we knew it wasn't legal. But we tried it because it was the best spot for it.

"We poured a cement block outside of the bedroom. But our fudge didn't work. The inspector came and said it would have to be moved. Then he came back again and said it would have to go. He said he would have to go to the city attorney if we didn't move it. Now it is sitting in the garage until I find a spot for it.

"The furnace does become a part of the house," Norris admitted. "I don't know about the compressors that are completely outside of the house. They are only connected to the house by two copper lines. I just don't know the answer."

A member of the audience explained, "Out here, that is considered a permanent fixture of the house. If it has to be

fastened in the window in any way, it's considered a permanent installation or a permanent fixture."

#### 'Vent Pulls Dust Down'

Mrs. Leigh Nayle wasn't complaining exactly. But she pointed out that "we have a big vent in the central hall downstairs. That pulls out a lot of the dust with it. We have to get down and clean that thing out once in a while with a vacuum cleaner."

"My husband thought I was crazy in the head when I wanted an air conditioner."

Mrs. Nayle is very pleased with her perimeter heating and cooling system, however.

"It is really wonderful," he said. "The only trouble we had was that the den was getting too cool and the kitchen wasn't cool enough. We have a long kitchen."

"So they did something. I don't know what they did, but

they adjusted it and we are very comfortable."

Operating costs? Mrs. Byron Smith had a cooling system added to her "fairly large" existing home in San Marino.

"We had only one duct added and it did everything," she said. "It cost a lot less than I thought it would to operate. It is a 5-ton compressor. The biggest raise over our winter (power) rate that we ever had was \$10 a month. You know how hot last summer was.

"Our house happens to be well insulated," she added. "Our wall and our roof is insulated, which is somewhat unusual. We also have some oak trees on the west side."

Mrs. Graff commented that her experience was the same.

"During the season when we keep it running constantly," she said, "our raise was \$11.75 over the previous bills. We retain a very wonderfully cool house on this basis.

HY FARBER DESIGN

#### \*AM-pak... Perfect Package for Air Moving Units

For evaporative condensers,  
air handling units and heavier  
heating equipment, Utility  
has created AM-pak, an entirely  
new design priced for high

production, combining efficiency  
with flexibility, strength  
with perfect dynamic balance.

Ranging in diameters from  
10 to 36 inches, the rugged blower  
wheel has 64 specially curved  
blades, features a conical  
center disc construction and  
operates at static pressures  
up to 6¼" W.G. You deliver greater  
air-power with less horse-power when  
your equipment is built with AM-pak.

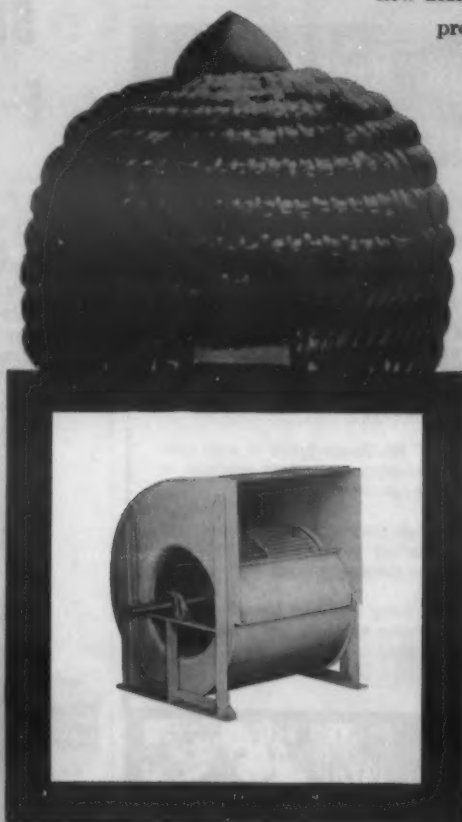
Scroll shapes and wheel diameters can be  
matched to your exact needs. Let us  
send you complete data.



UTILITY FAN CORPORATION

911 East 59th Street, Los Angeles 1.  
International Division, 141 El Camino Drive,  
Beverly Hills, California. A division of  
Utility Appliance Corp.

\*Air Moving Package.





# Natural Gas System Conditions Restaurant at Low Operating Cost

BELLEVILLE, Ill. — Augustine's restaurant at the edge of Belleville, claimed to be the largest restaurant in southern Illinois, was air conditioned throughout last summer at a basic operating cost of only 37 cents an hour.

The 10,000-sq. ft. building, containing dining room, cocktail lounge, banquet room, and two private dining rooms, was cooled by a 45-ton system hooked up to a natural gas powered compressor and ice accumulator.

According to L. H. Kiefer, refrigeration contractor here who made the installation, it was the first time a Ready Power gas engine refrigeration unit has been tied in with an ice accumulator.

Operating costs during the month of August averaged 37 cents per hour of unit operation for natural gas, which was being purchased at 70 cents per 1,000 cu. ft.

Cost of operating three 2-hp. circulating pumps for the various zones of air handling units, plus the blower motors on the air handling units, and the fan motors on the cooling towers was additional.

The system not only gave the Augustine brothers very economical air conditioning, but it provided the flexibility needed to keep comfortable a few groups in the cocktail lounge or nearly 700 banqueteers.

Kiefer installed a 60-ton Ready Power unit in a store-room attached to the rear of the building. Though only 45 tons capacity at 20° F. suction temperature was needed to take care of the original building plus the expansion of the restaurant that was then in progress, the 60-ton unit was required because of the low suction pressure at which it operates while accumulating ice on the Dole ice cell plates.

The five-cylinder radial compressor operates at a minimum

of 20° F. suction temperature when freezing ice on the plates of the ice cell. But it operates at high suction temperatures, up to 40° F.—depending on water temperatures—when the ice cell is operating as a water chiller, Kiefer explained.

When the engine turns at more than 1,200 r.p.m., all five cylinders are in action. But as motor speed drops below that figure, cylinders drop out one by one, cutting fuel consumption and thus cost of operation.

Once started in the morning, the engine operates continuously until manually turned off in the evening or until shut off by electronic ice thickness control. It modulates constantly.

The system is designed to handle peak load on the entire building and occupancy until 5 p.m.

By that time, under peak loads, the ice bank has been dissipated. But the ice cell operates as a water chiller and provides sufficient chiller capacity to take care of any night load imposed upon it, Kiefer added.

The ice accumulator tank stands next to the compressor. It measures 11 by 13 by 7 ft. deep. It holds 30 36-by-108-in. cold plates and 7,500 gals. of chilled water in addition to accumulated ice.

Chilled water coils run from the tank to nine Frigidaire air handling units adapted for use with water coils rather than direct expansion coils. Seven of the units are 5½ tons' capacity each. Other two have 4½ tons' capacity.

Chilled water is delivered to the air handling unit cooling coils at 41° F. This water temperature to the coils can be lowered to as low as 35° F. as required for additional latent heat removal, Kiefer said.

Two units are mounted behind the rear wall of the 40 by 80-ft. banquet hall. Three others, hidden in a furred-down

ceiling along one side, help cool the further reaches of the room.

Two other units in the furred-down ceiling cool the dining room and one the cocktail lounge on the opposite side of the wall. Another serves two small private dining rooms at the front of the building.

Grilles on the under side of the furred-down ceiling bring return air back to the units. Fresh air is introduced at the rate of 4,000 c.f.m.

Kitchen itself is not air conditioned. Two large exhaust fans keep the kitchen help comfortable.

They also provide positive displacement of air in order not to pressurize the building to the extent of reducing the fresh air input, according to Kiefer.

To dissipate heat from the condensing unit and gas engine, two Goodfellow cooling towers are installed at rear of building. One has 25 tons and the other 50 tons' capacity.

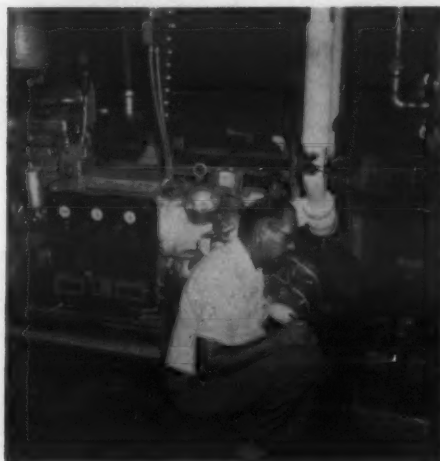
It takes about 20 tons to cool the gas engine jacket and 45 tons to cool the condenser.

Tower fans are hooked up in tandem and are cycled by head pressure control, he explained. Water delivery to towers is proportioned to engine speed by power takeoff from the engine which drives the pump through V-belts.

A boiler pumps hot water through the cooling coils during winter for heating, Kiefer said.

The Augustine brothers started their restaurant little more than a year ago.

They solicited banquet and party trade and met with immediate success. Soon, their 10,000-sq. ft. building was too small. Anticipating crowds of up to 1,000 persons at one time, they decided to add another 56 by 100-ft. banquet hall next to the already existent dining hall. To take care of this addi-



L. H. KIEFER, installing contractor, checks gas meter to verify low operating cost rate for air conditioning system powered by natural gas engine behind him. The unit in Augustine's restaurant in Belleville, Ill., is first of its kind hooked up with an ice accumulator. The latter is directly behind the gas engine.

FURRED DOWN CEILING holds six air handling units. Three cool this banquet hall, two others cool dining room and cocktail lounge on opposite side of wall, and one handles two small private dining rooms at far left.



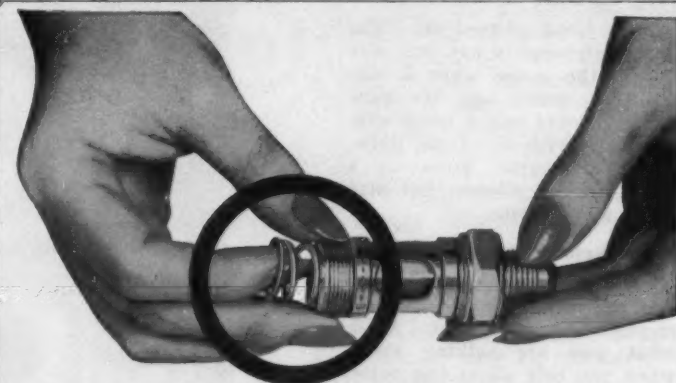
tional load, Kiefer increased the water flow through the ice cell doubling its previous capacity when used as a water chiller.

A 45-ton air handling unit with water coil was installed to take care of the new banquet hall's cooling and heating requirements.

When the Dole ice cell is used as a water chiller, the suction pressure automatically increases, resulting in increased

compressor capacity up to 60 tons when suction pressure increases to the equivalent of 40° F. suction temperature.

Both sensible and latent conditions within the restaurant, cocktail lounge, private party rooms, and banquet halls have been entirely satisfactory with circulated chilled water temperatures as high as 52° F. This is true even though latent load is unusually heavy, Kiefer noted.



## SHE'S PUTTING SPRINGS IN E-Z-SEE LIQUID INDICATORS

To you, E-Z-See liquid indicators with spring compensated gaskets mean NO LEAKS—with Refrigerant 12 or Refrigerant 22—at operating pressures through 500 p.s.i. and operating temperatures up to 200° F. and down to minus 40° F!

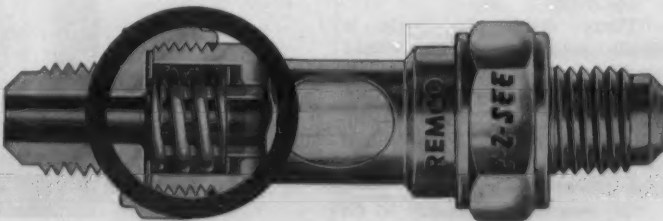
Double port, easy to see through, spring compensated E-Z-Sees are available with male flare x male flare, male flare x female flare and with extended sweat connections which permit soft or silver soldering without disassembly.

E-Z-Sees are also available with a very sensitive FLO indicator flap directly in the refrigerant stream. With this sensitive flap all variations in flow are instantly indicated.

The full story is given in Bulletin R-11. Write today for your copy.

AVAILABLE TO THE TRADE THRU WHOLESALERS

**REMCO INC.**  
ZELIENOPLE, PA.



## Add a "King Zeero" ICE BANK to Your Refrigerating System for Effectual, Economical Air Conditioning

The "King Zeero" ICE BANK is designed to deliver 32° to 34° F. ice water for recirculation through air cooling coils in exactly the right amount when and where it is needed. It levels off "peak" and "valley" loads. Peak loads many times compressor capacity are easily handled. Ice Banks may be added to increase existing capacity. Refrigerant: Freon, Methyl Chloride or Ammonia.



The Patented Coils with Built-in Louvers opposed to the flow of water through the ICE BANK provide turbulence. This eliminates a mechanical agitator - insures all the water rubbing all of the ice. No upkeep or repair expense whatever.

The "King Zeero" Ice Storage System of water chilling has definite advantages over direct expansion, or other types of ice accumulators.

Saves power through smaller compressor requirement. Simple construction (no moving parts). Dependable in performance. Low operating and costs.

Let the ice stored during light loads take care of peak loads. The compressor need only handle the average daily load - not the peak.

CAPACITIES - 500 lbs. to 30,000 lbs. (72,000 B.T.U.'s to 4,320,000 B.T.U.'s) in a single unit. Multiple units may be installed.

**THE KING ZEERO COMPANY**  
4300-14 W. Montrose Ave. - Chicago 41, Ill.  
Manufacturers of Ice Builders - Ice Builder Cabinets - Ice Banks



# LOOK!



that gets  
sales action

Here's a new feature with tremendous customer sales appeal. It's Inland's "Magic Touch" Handi-Stor Ice Cube Trays and Ice Chest.

Every time you demonstrate the features of your refrigerator the exclusive advantages of the "Newest Way To Have Ice Cubes A-Plenty" will be helping you **SELL MORE REFRIGERATORS**.

Inland's national advertising will be pre-selling your prospects too... so be ready... make sure you order your refrigerators with the new "Magic Touch" Handi-Stor Trays and Ice Chest.

## NEWEST WAY TO HAVE ICE CUBES A-PLENTY!



**"Magic Touch"**  
Lever releases  
a trayful

ICE CHEST  
STORES LOADS  
OF ICE CUBES

Want the newest idea for ice cubes galore? Buy a refrigerator with the new "Magic Touch" Handi-Stor ice cube trays.

**Like ice cube magic**, just flip the "Magic Touch" Handi-Stor lever and a trayful of hard, dry ice cubes drops into the ice chest. It's so clean and quick—and your hands stay dry.

**You always have several trayfuls** of ice cubes on hand this new, magic way. The Ice Chest is handy in kitchen, or as a serving accessory. "Magic Touch" trays come in sparkling colors.

**Insist on new "Magic Touch" Handi-Stor ice cube trays in the new refrigerator you buy.**

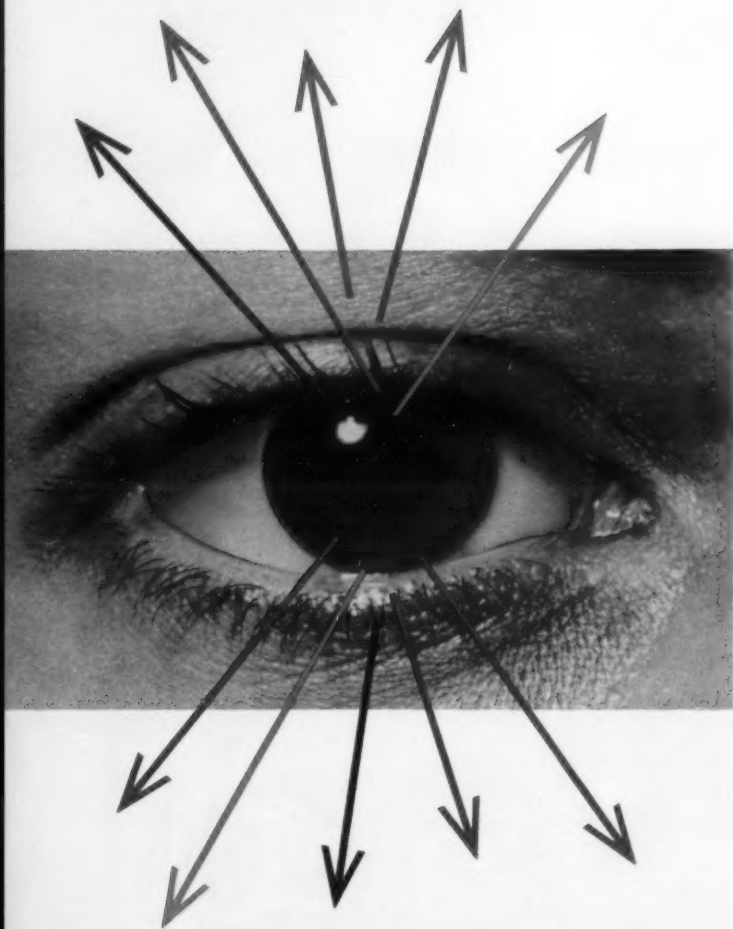


**"Magic Touch"**

**HANDI-STOR ICE CUBE TRAY**

INLAND MANUFACTURING DIVISION • General Motors Corporation, Dayton, Ohio





Refrigerator prospects  
are reading about this  
new Ice Cube Convenience...  
it's a GREAT SALES  
CLOSING FEATURE!

Yes, you can easily see that Inland's "Magic Touch" Handi-Stor Ice Cube Trays have a sales compelling appeal to refrigerator prospects. It's a customer appeal which keeps "Magic Touch" trays "top standard" in ice cube convenience.

Inland's national advertising in leading consumer magazines, such as, The Saturday Evening Post and Better Homes and Gardens, pre-sells your refrigerator prospects before they come in to have a closer look.

Inland's advertising can mean refrigerator sales to you. Be ready to "cash in" on this consumer desire for the NEWEST in ice cube convenience.

Order your refrigerators equipped and shipped with Inland "Magic Touch" Trays and Ice Chest.

**"Magic Touch"  
Lever releases  
ice cubes  
by the trayful!**

**STORAGE CHEST  
HOLDS THEM  
FOR  
INSTANT USE!**

Yes, it's wonderful to have the very latest ice cube convenience. Be sure you buy a refrigerator with new "Magic Touch" Handi-Stor ice cube trays.

**Just like magic**, you flip the "Magic Touch" Handi-Stor lever and a whole trayful of hard, dry cubes drops into the storage chest. Simply wonderful—there's no muss, no fuss. Your hands stay dry, too.

**You have ice cubes galore**—several trayfuls—always ready for instant use. Ice Chest is handy in kitchen or for serving. Trays come in sparkling colors.

**Insist on new "Magic Touch" Handi-Stor ice cube trays in the new refrigerator you buy.**



**"Magic Touch"**

**HANDI-STOR ICE CUBE TRAY**

INLAND MANUFACTURING DIVISION • General Motors Corporation, Dayton, Ohio

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## Sales Executives Club Survey Finds only 3% Asked To Buy Cooling

WILMINGTON, Del.—Only three out of 105 members of the Wilmington Sales Executives Club had been approached this year at home or by phone by a salesman selling air conditioning, a questionnaire circulated recently among members disclosed.

Air conditioning ranked with hi-fi sets at the bottom of a list of products about which members were questioned, according to William Bours, director of sales, Freon Products Div., du Pont. Bours suggested that air conditioning be included among the nine questionnaire items.

On the other hand, the questionnaire revealed, 45 members had been approached by insurance salesmen, 24 by automobile salesmen, and 10 were asked to buy a new suit.

## Church System Designed To Meet Needs of Rooms Used Once Each Week

DALLAS — Texas Refrigeration & Engineering Co. here has air conditioned for year-round comfort the newly-completed \$200,000 educational building of the Cedar Crest Baptist church.

J. G. Hailey, sales engineer for Texas Refrigeration, said the "Tresco" latent storage system of air conditioning installed in Crest Baptist church is designed for churches where certain rooms are used only one day during the week, Sundays, while adjacent rooms, like church offices, need constant year-round air conditioning.

Hailey said the entire two-story Crest Baptist church educational building was fully air conditioned by Tresco's latent storage system which required approximately 90 tons of air conditioning.

## Illegal Unvented Heater Blamed for 7 Deaths

SAN FRANCISCO — State Div. of Housing reported that in an unincorporated area of Fresno county, an illegal unvented gas heater in a dwelling claimed the lives of seven persons.

As a result of this tragedy, the Fresno County Building Code Appeals Board has instructed the chief building inspector and the county counsel to prepare an amendment to the building code which would require county permits for the installation of gas appliances.

## Radiant Heating, Cooling Institute Names Smith Pres.

LOS ANGELES — Radiant Heating & Cooling Institute recently elected new officers for this year.

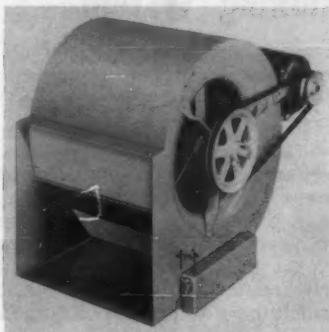
Don Smith, Pasadena, has been named president, succeeding George Rusher, Inglewood. Other officers: Dave Longerot, South Gate, vice president; Harry Taylor, Costa Mesa, secretary; and Al Ottum, Los Angeles, treasurer.

## Blower Offers Automatic 2-Volume Air Delivery Without Pulley Changes

CLEVELAND — Automatic two-volume air delivery without the necessity for pulley changes or mechanical manipulations is now claimed for the new "Du-Air" blower produced by Morrison Products, of this city.

Control of the air volume is obtained by the heat-cool control of the normal thermostat, or a control panel may be used if separate heating and cooling thermostats are needed, according to the company.

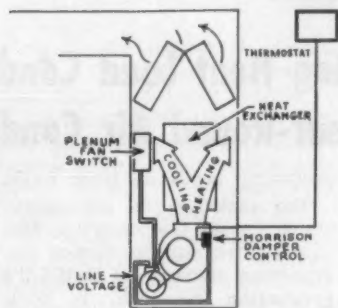
The Du-Air blower, either direct drive or belt driven, makes use of an automatic damper control actuated by a solenoid at the demand of the thermostat. The damper has a full-open position and a partially closed position which can



MORRISON "Du-Air" Blower.

be adjusted according to the specific needs of the installation.

The automatic damper control mechanism is only 1½ in. wide and is attached to the blower housing. The Du-Air is adapt-



TYPICAL installation diagram for Du-Air blower.

able to present systems, requires no added space, requires only one control for all installations, and will reduce the cost of installation when compared to other methods of obtaining volume control, it is claimed.

In applying the blower to existing systems, it is possible to adjust the partially-closed position of the damper with two

small set screws in the damper control, making it simple to adapt the blower to the present duct system.

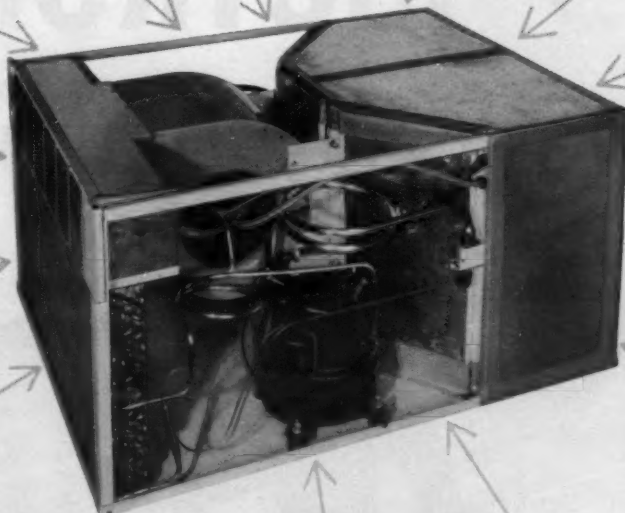
Since the Du-Air will make pulley changes, motor-operated dampers, two-speed fans, and fans in series unnecessary, it is the company's position that development of the new blower is an important step in upgrading units offered the public.

Typical installation diagrams are available from the company.

## Little Rock Federal Bldg. To Be Air Conditioned

LITTLE ROCK, Ark. — According to information received here from the General Services Administration in Washington, D. C., Fagan Air Conditioning Co. of Little Rock has been awarded a \$746,798 contract to install air conditioning and some fluorescent lighting fixtures at the Federal building.

**HERE'S THE LINE DESIGNED FOR YOU!  
Easy to Install! Easy to Service! Easy to Sell!**



## Manning-Bowman® CENTRAL AIR CONDITIONING SYSTEMS

### MANNING-BOWMAN CENTRAL AIR CONDITIONING SYSTEMS

give you and your customers outstanding performance, trouble-free operation and more beneficial features than most other competitively priced systems! **THIS IS YOUR CHANCE TO UP YOUR SALES VOLUME HIGHER THAN EVER BEFORE!**

#### MANNING-BOWMAN SLIDE-OUT CHASSIS

Slide it in to install; slide it out to service!

#### MANNING-BOWMAN WEATHER-PROTECTED CONTROLS

Sealed against the elements, controls can't rust or short out, and on self-contained units, complete factory-wired controls make installation even easier. Just bring in power and low-voltage supplies.

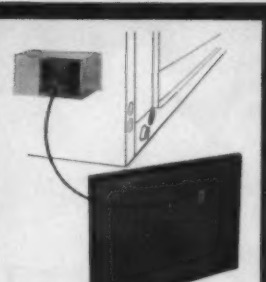
#### MANNING-BOWMAN 'PERMALIFE'® FINISH GIVES HIGH-PROTECTION

Cabinets are weather-protected with high-baked enamel. This UL tested finish withstands 2600-hour salt-spray tests. Exterior panels are easily removed for installation and service!

**SELL AND PROFIT THE EASY WAY  
...THE MANNING-BOWMAN WAY!**

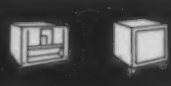


**Manning-Bowman®  
MANNING-BOWMAN DIVISION  
MCGRAW-EDISON Co. Albion, Mich.**



#### MANNING-BOWMAN EXCLUSIVE Lectorfilter® SELLS ITSELF!

This unique development has impact as an important health feature! Exclusive Lectorfilter generator is standard equipment on all self-contained central systems. The electrostatically-charged filter collects and holds tiny grains of dust and pollen—a boon to allergy sufferers.



#### MANNING-BOWMAN 4 h.p. SELF-CONTAINED SLIDE-OUT CHASSIS

Self-Contained models 2, 3 and 4 h.p.  
Remote models—3, 4 and 5 ton.

### Manning-Bowman Division Dept. MB85-AC, Albion, Michigan

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
FIRM NAME \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



Gulf Oil Research

## Lab's Widely Changing Heat Load Conditions Require Special Design of Year-Round Air Conditioning System

HARMARVILLE, Pa.—Limited space available for the installation of year-round air conditioning equipment, plus a need for cooling in one zone and heating in another at the same time, was the major problem confronting engineers for the new W. L. Mellon Production Research Laboratory at the Research Center of Gulf Oil Corp.

So states W. V. Coleman, chief engineer of Wigton-Abbott Corp., Plainfield, N. J., architect-engineer and constructor of the new Harmarville facility.

Purpose of the new laboratory is to house research staff and equipment to develop new methods and refine existing procedures for drilling oil wells and

producing crude oil from wells. The 48,000-sq. ft. laboratory, which houses the Reservoir Mechanics Div. and Production Engineering divisions of Gulf Oil's production research, is completely fireproof and set up on a building pattern of 14 by 20-ft. modules for maximum floor space flexibility.

### VARIABLE MODULE

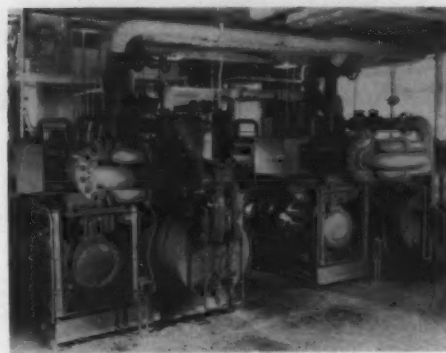
A module may contain either an office or an individual laboratory; or several modules may compose one large laboratory.

According to Coleman, in planning the various laboratory rooms, variable operation of the laboratory testing equip-

ment required that in some laboratories widely changing heat load conditions needed special design attention.

This meant the equipment selected for conditioning would need to be capable of cooling at one period and then switching to heating the next—and vice versa. In addition, under certain circumstances, the equipment would have to provide cooling in one room and heating in an adjoining room at the same time.

The design adopted was to install a combination system consisting of Trane "UniTrane" fan-coil room air conditioners in each individual perimeter space (129 total), a central fresh air supply system distributing con-



TWO Trane "Cold Generator" reciprocating refrigeration units provide chilled water for cooling new W. L. Mellon Production Research Laboratory for Gulf Oil Corp. Heat exchanger converts steam to hot water for heating. Cooling is provided in one room and heating in another by operating systems simultaneously and utilizing separate piping to room air conditioners.

ditioned air to corridors and rooms, and central station water chillers. A heat exchanger setup is used to convert available steam to hot water for heating.

The fan-coil units are furred-in with removable metal access panels. They have separate heating and cooling coils, and an individual dry-bulb pneumatic thermostat to control three-way water valves to the cooling and heating coils.

Separate piping to the room air conditioners makes possible the provision of simultaneous heating and cooling in different laboratory areas.

To assist the fan-coil units in maintaining close temperatures, a separate central system for ventilation air was provided.

This system consists of a single large capacity "Climate Changer" fan-coil air handling unit that conditions 100% outside air and distributes it through a common duct running the length of each corridor.

### SUPPLY CHILLED WATER

Grilled outlets along the corridor ducts release the fresh air into each module.

The central station ventilation unit has constant delivery temperature and humidity controlled by thermostats in the discharge duct which control cooling and reheat coils and humidifier as required. A separate bank of pre-heat coils is controlled from outside air temperature.

Chilled water supplied to coils in the room air conditioners and Climate Changer comes from two Trane "Cold Generator" packaged water chillers. Each chiller cools 300 g.p.m. of water from 53° F. to 45° F. when supplied with condensing water at 85° F. Leaving temperature of the condenser water is 95° F.

The chiller compressors are the reciprocating type with an unloading arrangement to reduce capacity to 50% of full load capacity, resulting in cost savings because of a corresponding decrease in power consumption, according to Trane.

During summer months, laboratories and offices will be kept at 80° F. dry bulb and 50% relative humidity when the outside dry-bulb reading is at 95° F. In the winter, a 70° F. dry-bulb temperature will be maintained in these areas.

Johansen Co., Garwood, N. J., was the installing contractor of the air conditioning system.

### Distributor's School Qualifies Dealers for Detroit Limited License

DETROIT—After attending an evening air conditioning school sponsored by Air-Con, Inc., 133 dealers interested in selling residential cooling were able to pass an examination similar to that given by the city of Detroit to qualify for a restricted refrigeration contractor's license, according to an Air-Con official.

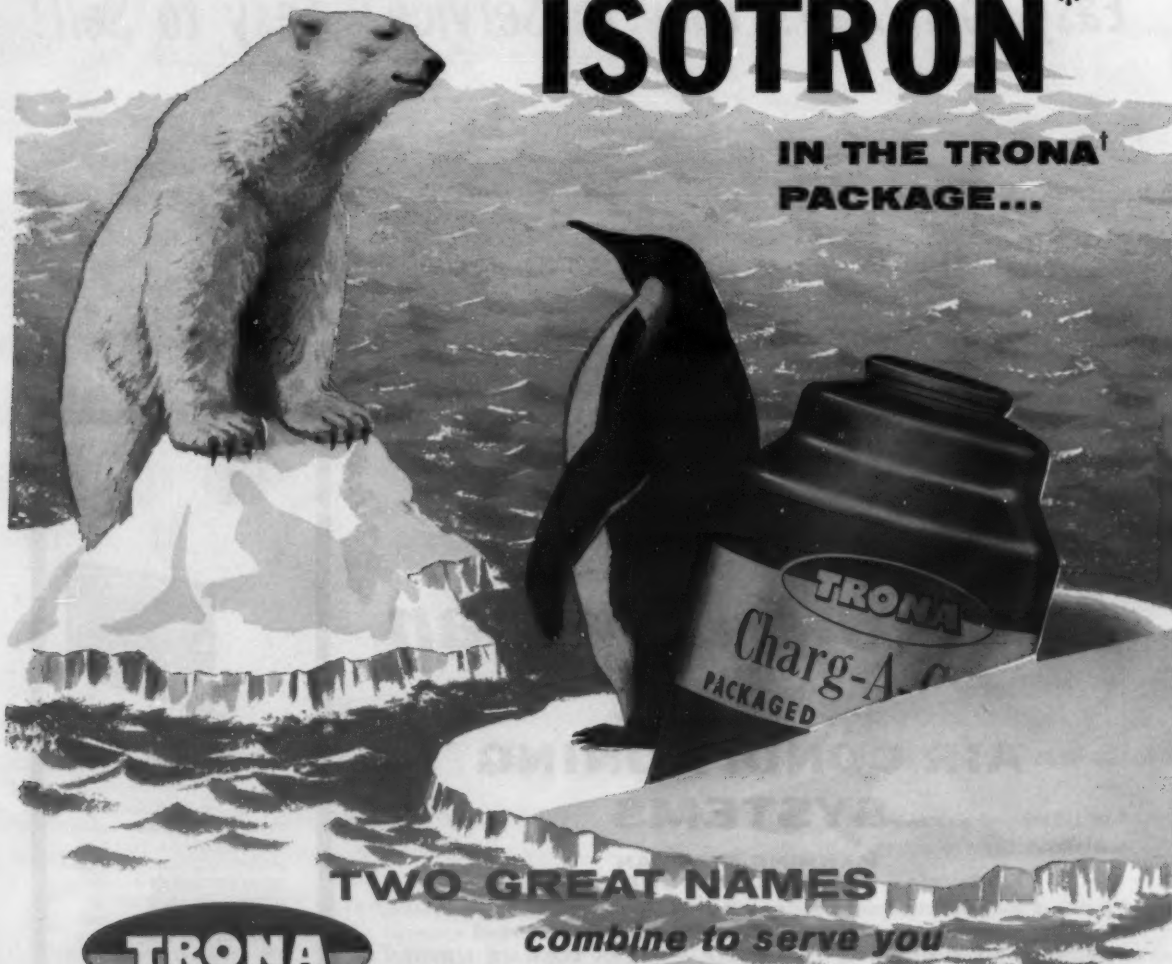
Air-Con is southeastern Michigan distributor for Armstrong, Vornado, and Winkler air conditioning equipment.

A restricted license would qualify the dealers to install but not service self-contained air conditioning equipment up to 7½ tons capacity.

## What's New in Refrigerants?

# ISOTRON\*

## IN THE TRONA† PACKAGE...



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### combine to serve you

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### Pennsalt Chemicals

\*"ISOTRON" is Pennsalt's registered trademark for its fluorinated hydrocarbons.  
†Trademark AP&CC

Effective immediately two leading factors in the chemical world join forces to serve the refrigerant industry. American Potash & Chemical Corporation, a leading national refrigerant distributor for 20 years, and Pennsalt Chemicals Corporation unite to bring you ISOTRON refrigerants, newest of the fluorinated hydrocarbons in CHARG-A-CAN† disposable containers and bulk cylinders. First with the full line, first in constructive service for wholesalers, contractors and service men, TRONA continues its refrigerant marketing leadership.



FIRST with the FULL LINE in disposable CHARG-A-CAN containers and bulk cylinders... ISOTRON-11, ISOTRON-12, ISOTRON-22, ISOTRON-113, ISOTRON-114, METHYL CHLORIDE and SULFUR DIOXIDE.

## TRONA

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Export Office: 99 Park Avenue, New York 16, New York



## 4-Sentence Service Agreement

**Firm Prospers, Without Using a Lot of Fine Print, by Giving Customer Good Service at Competitive, But Profitable, Rate**

By George M. Hanning

MEMPHIS, Tenn.—Why get tangled up in a complicated service contract when a simple one will do?

Buchanan Avery and George E. Cline, partners in Central Refrigeration Co. here, discarded the usual small print document that tries to cover every possible detail shortly after they started in business together three years ago.

In its place they substituted a four-sentence agreement that takes up half a sheet of letter paper. It puts in writing only the bare essentials and leaves the working details to mutual understanding.

It does the job, according to "Buck" Avery, for the firm has never yet lost a contract customer.

### 4 Sentences of Contract

Central Refrigeration's contract reads as follows:

"For the sum of \$.....per month, Central Refrigeration Co. agrees to furnish all labor to service refrigeration at the following location:....."

"This includes one (1) inspection per month plus any other calls that might be necessary to keep machines in good condition."

"Parts will be paid for by customer at list price less 10% discount."

"This contract does not include electrical wiring inside cases, any plumbing, or disassembly or moving of any refrigerated cases."

That's it.

One may argue that this contract leaves a lot unsaid. Avery and Cline admit that. But they insist it covers most points likely to come up in normal customer-contractor relationships.

"We don't need a complicated form," Avery said. "The customer knows he can cancel the contract on 30 days notice if he doesn't like the service. We can, too."

### All Equipment In Store Is Covered

To avoid arguments, Avery and Cline cover all refrigeration equipment at the customer's store with their contract. If the customer has air conditioning, they service that, too.

If new equipment is added after the contract takes effect, the monthly charge is increased accordingly by mutual agreement.

"The main thing is to check the equipment thoroughly when making that monthly call," Cline declared. "Let the customer know you are checking it. He wants to feel that he is getting his money's worth."

"You can't make contract service pay if you aren't going to give service," he added. "You have to do more than look at the equipment to earn your money each month."

In so doing, the servicemen nip in the bud little troubles that could grow into major ones if left undisturbed. This saves money both for the customer and for the company.

Customers, they admit, will test you out at first. They will make seemingly unnecessary calls to see if you will really give the service you promise.

"But once they learn to trust you," Avery noted, "they don't give any trouble by quibbling. The majority want us to go ahead and keep their equipment running at lowest possible cost. They readily o.k. new parts we suggest for efficient operation. And we suggest only those that are really necessary."

Avery and Cline have about 60 service contract customers, most of them food markets. About five restaurants are

served, including one chain.

They feel that is all they can efficiently handle. Avery said they have turned down prospective service contract customers because they do not have time enough to do a good job.

Such customers are turned down, not away. Central Refrigeration continues to serve them on a "per call" basis.

### 60% of Time Devoted To Service Contracts

As it is, Avery and Cline devote about 60% of their time to contract customers. The rest is spent selling commercial refrigeration and air conditioning equipment and doing straight

service work, according to the partners.

Trying to expand by adding another man has not worked out, Cline indicated.

"A man working for you does not have the same interest in seeing that the customer is satisfied as you do yourself," he observed.

Handling all service themselves, they become intimately familiar with the customers' equipment. But they still keep complete records of each call. By checking the records periodically, they can tell whether a particular contract is producing profit or not.

If a contract proves to be a consistent loser, they make adjustments in their contract price by mutual agreement with the customer. The customer, of course, has the privilege of cancelling out if he does not want to pay the higher tab.

"This business is like the in-

surance business," Avery commented. "We may lose money for a month or two, but over the year we will come out ahead."

Still, service contracts are no gold mine, Cline indicated. "Alley shop" competition squeezes their service charges lower than they ought to be, he indicated.

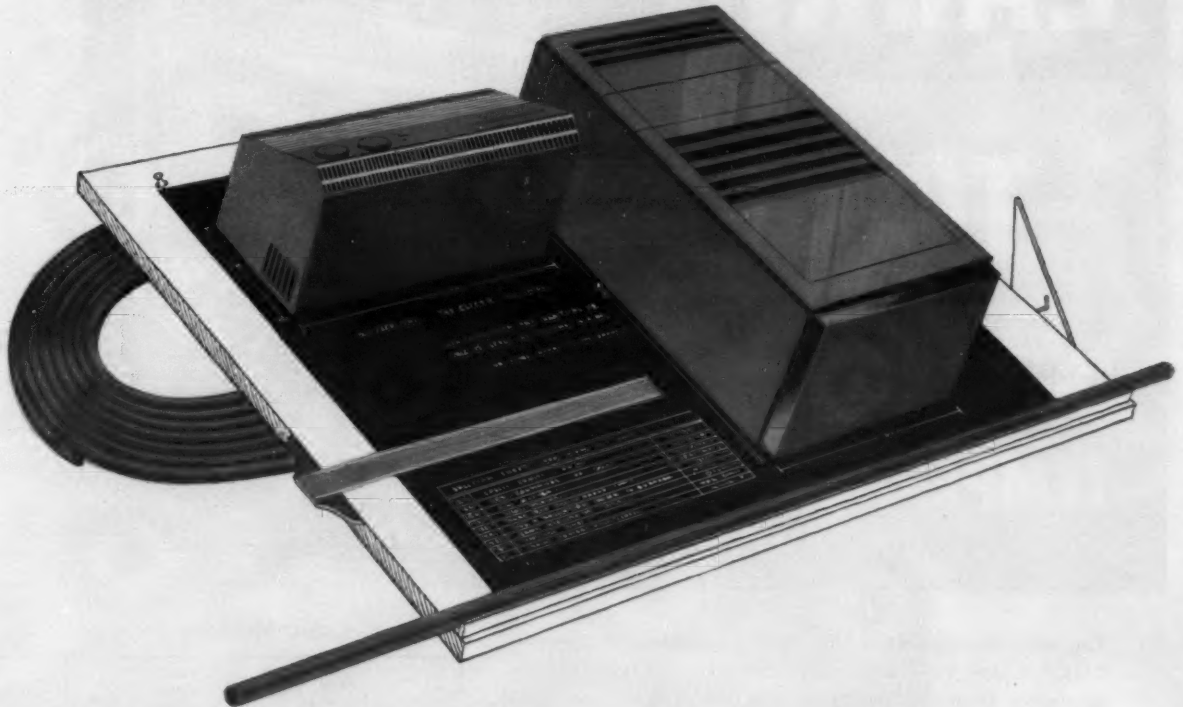
### Trucks Carry Large Parts Inventory

To keep their charges competitive—though by no means the lowest in town—, they watch all cost angles. One way they realize significant savings is by maintaining a \$400 to \$500 parts inventory on their trucks.

With almost any needed part at hand, they can complete in one call many jobs that might otherwise require costly part chasing and time-consuming call backs.

Avery and Cline have built their business on word of mouth and telephone book advertising.

**For your  
REFRIGERATION, AIR CONDITIONING  
and HEATING UNIT NEEDS . . .**



**Specify Quality-Controlled  
PHELPS DODGE COPPER TUBE!**

- All tempers and sizes for use in original equipment.
- Straight length tube tempered to meet your bending and expanding specifications.
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# Unit-Type Air Conditioner Service

**Prerequisites: Adequate Design, Proper Application, Installation, Operation, Maintenance, Examination**

By J. F. Martin, Assistant Chief Engineer, Machinery Div.,  
The Hartford Steam Boiler Inspection & Insurance Co.

The figures shown in the accompanying tables are based on the study of unit-type air conditioner failures occurring from January, 1953 until September of 1957, and which were investigated by this company. The data was obtained from accidents of which studies were made at the scene as soon as possible after each failure.

The studies were often continued in the manufacturer's plant or in a service shop where the units were partially or fully disassembled. All investigations were made by inspectors who are experienced in determining

from the available evidence, the part which failed first and the direct cause of the failure.

Prerequisites for safe and satisfactory service of any refrigeration and air conditioning equipment are adequate design, proper application, installation, operation, maintenance, and regular examination by individuals qualified to recognize the early development of trouble.

Oftentimes, most of these prerequisites are disregarded because unit-type air conditioners are forgotten after installation. Thus, the intent of this classification study is to bring to the

attention of the reader the kinds of conditions that cause failures, as a means of pointing the way to more effective accident prevention in connection with this class of equipment.

## Causes

The study reveals that the failure of electrical components accounted for 63% of the accidents, the mechanical components 27%, and the refrigerant piping the remaining 10%. Motor windings, controls, bearings, and refrigerant piping were the initial parts that failed in 87% of the cases.

The table lists the direct causes of failures but does not present information indicating

how the causes were affected by other factors. A more detailed analysis indicated that over 62% of the motor winding, control, bearing, and refrigerant piping failures might well have been prevented had the units received a little attention while in operation, and a reasonable amount of preventive maintenance.

The preventable causes include failure to:

- Keep electrical components free of foreign materials and moisture,
- Rewind or to replace motors having seriously deteriorated windings,
- Tighten electrical connections and maintain electrical contact surfaces.
- Maintain an adequate and clean supply of proper lubricating oil,
- Determine the cause of and promptly eliminate excessive vibration,
- Properly adjust belt tension, and
- Properly operate shut-off valves in the cooling water lines to condensers.

## Motor Windings and Controls

The short circuiting and burning out of the windings of main and auxiliary motors and their controls accounted for 53% of the failures, indicating the need of taking precautions to reduce such failures.

The causes of single-phase operation which resulted in winding failures of three-phase main and auxiliary motors were divided about equally between interruptions of one phase of the power supply and between failure to tighten electrical connections and failure to maintain electrical contact surfaces. Failure to tighten electrical connections was a major cause of accidents to controls as well as windings.

Proper maintenance of protective devices would have prevented the majority of winding failures caused by single-phase operation resulting from an interruption of one phase of the power supply. There is no real excuse for failures due to failure to tighten electrical connections and failure to maintain electrical contact surfaces.

The percentage of failures resulting from moisture may be surprising to some, but a relatively small amount of moisture absorbed by the insulation of electrical equipment will often set up hazardous conditions that may cause a serious failure. Therefore, all practical precautions should be taken to keep the windings of the electrical components dry.

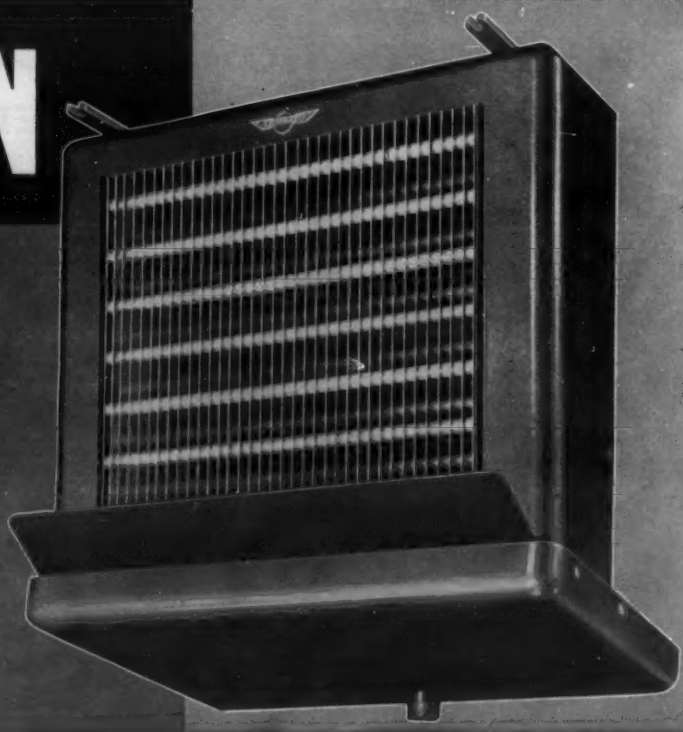
Failures due to deterioration of the insulation result from causes incident to age and operating conditions. As electrical failure of insulation is generally preceded by the mechanical breakdown, many such failures can be prevented by thorough examinations of the windings by men who are trained to recognize the weak points of insulation and the symptoms of impending trouble. On too many occasions electrical components fail only because they are con-

(Continued on Page 21, Col. 2)

# LARKIN

## TOPS

### IN LOW TEMPERATURE



You name the application. For low temperature requirements, LARKIN is tops. There are ceiling, wall, and mullion humi-temps to choose from, all equipped with the simplest fool-proof automatic hot-gas defroster on the market—Frost-O-Trol.

Installation of units with Frost-O-Trol is quick, simple and economical. All you have to do is run one extra wire, one extra gas line and mount the compact control panel.

Secret of the patented Frost-O-Trol system is the factory-installed metering orifice which protects the compressor against slug back—making a re-evaporator completely unnecessary.

See your wholesaler or write for Bulletins 1032 and 1056.

## Quality Features

- Minimum temperature rise during defrosting
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- No excess heat or moisture load
- Lower operating costs
- Higher efficiency of evaporator unit
- Heat applied throughout entire evaporator
- Melts frost from inside out
- Simple, low-cost installation
- Drip pan is electrically heated by a carbon impregnated, water-proof, molded rubber pad—assures positive drainage of melting ice and water—prevents freezing and spill-over
- Larkin patented Cross Fin coil—staggered tubing
- Heavy gauge die stamped aluminum case
- Self-locking nuts; vibration-proof assembly
- Standard motors with thermal overload protection

## BASIC RATINGS

Model	Capacity Rating Btu/hr @ 10°F TD	Total Surface Area	Cfm
LT-26	2600	69	800
LT-32	3200	79	1000
LT-42	4200	98	1400
LT-52	5200	131	1550
LT-65	6500	150	1700
LT-82	8200	201	2200
LT-104	10400	226	2800
LT-130	13000	301	3200
LT-160	16000	401	4400
LT-240	24000	501	5600

## FROST-O-TROL® HOT GAS DEFROSTING ALSO AVAILABLE ON THE

### WALL HUMI-TEMP

### AND THE MULLION HUMI-TEMP






**LARKIN COILS** INC.  
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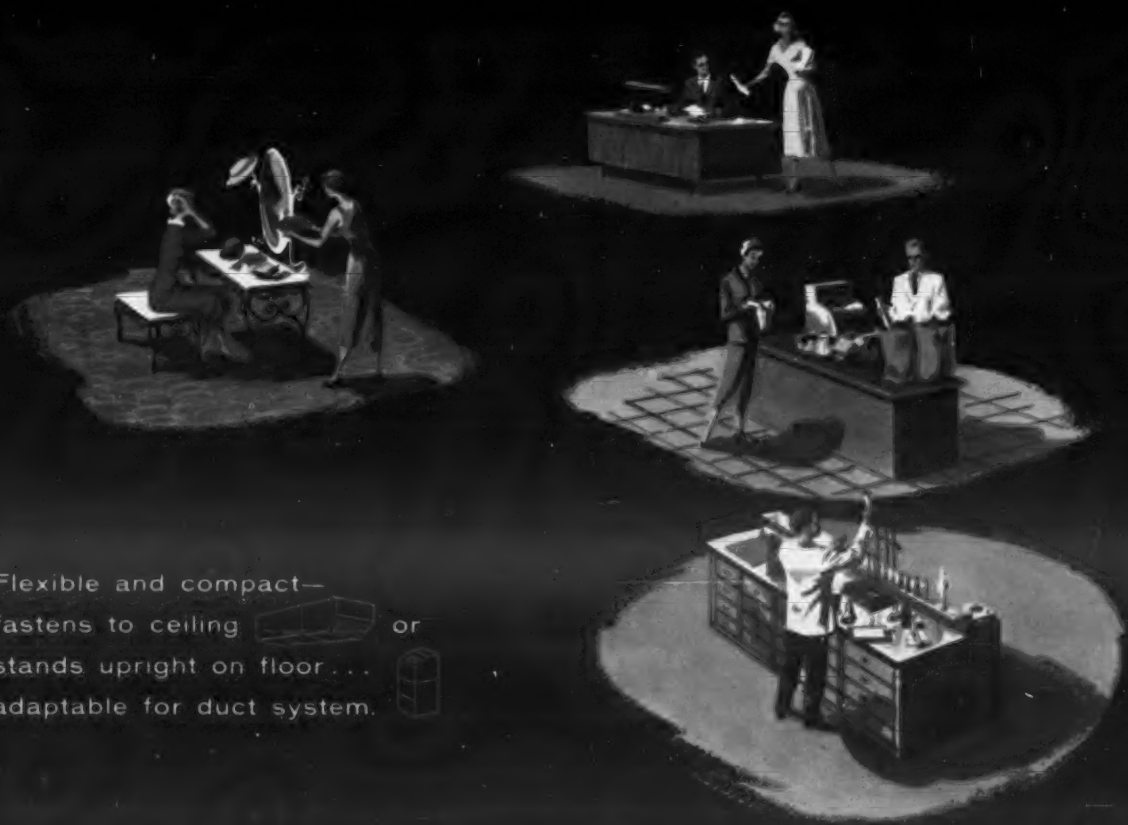


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new **JANITROL** AIR COOLED  
packaged air conditioner



Flexible and compact—  
fastens to ceiling  or  
stands upright on floor...   
adaptable for duct system. 



Easy solution to a wide range of  
residential and commercial  
cooling problems . . .

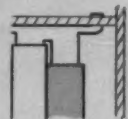
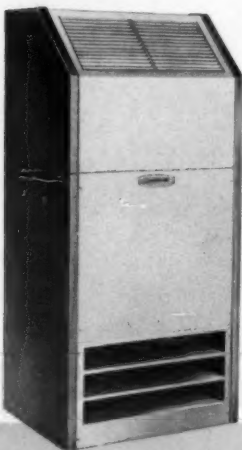
## new JANITROL COMPACK

"packaged" waterless cooling conditioner

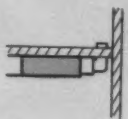
This versatile new cooling conditioner lends itself to an exciting variety of cooling applications . . . meets your need for maximum cooling efficiency in little or no floor space at all!

It is designed for free air discharge or use with a duct system . . . may be suspended overhead or positioned on the floor. *Waterless* operation assures quieter, thriftier operation—establishes a new concept of cooling performance. The complete refrigeration assembly is housed in a remote air-cooled unit that's engineered for comfort-cooling with outside air temperatures to 125° F.

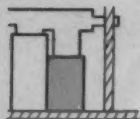
For your next residential or commercial job, provide controlled, high-efficiency cooling free from objectionable noise and drafts with the Janitrol Compack . . . one of Janitrol's complete line of conditioners for cooling and heating-cooling applications. Ask your Janitrol representative for full details.



Janitrol "Compack" in parallel with warm-air "up-flow" furnace completes a year 'round comfort system.



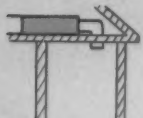
In basements with low headroom, "Compack" saves space—may be suspended from joists and utilize existing warm air ducts through a by-pass system.



Janitrol "Compack" blower coil unit with up-flow furnace in first floor closet or utility room.



"Compack" installed overhead in an office. Whisper-quiet, it never intrudes to disturb busy people.



Janitrol "Compack" in attic—cools entire house through small ducts feeding diffusers near ceiling of rooms below.



"Compack" feeding a duct system in modern store. Several "Compack" units can be combined to meet a variety of cooling needs—provide zone control where desired.



"Compack" installed upright on the floor in restaurant. Draftless, free-air discharge.

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## JANITROL WIN-SUM-MATIC Year 'round conditioner

Combines thrifty gas heating, waterless cooling in little as 3-3/5 sq. ft. of floor space. Famous 20 year warranted Dura-Tube heat exchangers. Unique by-pass gives correct air flow for heating and cooling without seasonal adjustments. Air cooled Pride O' Yard unit is low, sleek, efficient . . . ADD-ON cooling option—install for heating only, add cooling later. Upflow and downflow models, 80,000 to 200,000 btu./hr. (to 120,000 on down flow) heating, 22,000 to 76,000 btu./hr. cooling capacities\*.



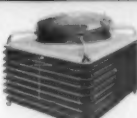
## SRA add-on cooling

Adapts most any warm air furnace for thrifty, efficient central cooling. Cooling coil mounts in duct, beautiful air cooled Pride O' Yard unit goes outside. Powerful, quiet performance with outside temperatures to 125° F. Easy to install. Waterless operation eliminates plumbing, sewage, water supply problems. 22,000 to 76,000 btu./hr. Capacities\*.



## Gas-fired Duct furnaces

Designed for installation in a duct where the air is circulated by a separate blower. Especially adaptable for industrial heating applications in combination with cooling. DUCT Series 55 in five sizes from 85,000 to 225,000 btu./hr. Series 75 in sizes 200,000 and 300,000 btu./hr. may be combined to provide unlimited capacity range.



### CAPACITIES\*



SRA-7—22,000 btu.  
SRA-9—35,000 btu.  
A-401 and 403—47,500 btu.  
SRA-11—58,500 btu.  
A-603—76,000 btu.

\*95° F. Dry Bulb air entering condenser, 80° F. Dry Bulb, 67° F. Wet Bulb air entering evaporator, approximately 400 CFM per 12,000 btu.

## JANITROL®

HEATING AND AIR CONDITIONING DIVISION

Surface Combustion Corp. 19601 • Columbus 16, Ohio

In Canada: Moffat Heating & Air Conditioning Division Moffat Ltd., Toronto 13

Also Makers of Surface Industrial Furnaces, Kathabar Humidity Conditioning, Janitrol Residential Heating and Cooling Equipment



### FAILURES

Component and Initial Part	Percent
Main Motor Windings....	35
Compressor Bearings ....	14
Controls .....	11
Refrigerant Piping .....	10
Main Motor Bearings.....	9
Aux. Motor Windings.....	7
Compressor Valves .....	6
Aux. Motor Bearings.....	1
Compressor Pistons .....	1
Oil Pumps .....	1
All Others .....	5

### DIRECT CAUSES OF FAILURE

#### MAIN MOTOR WINDINGS

Cause	Percent
Single-Phase Operation .....	19
Lightning or Line Surges.....	16
Moisture .....	14
Deterioration of Insulation....	12
Overloading .....	9
Defective Material and/or Poor Workmanship .....	8
Foreign Material (dirt, grease, etc.) .....	3
Low Voltage .....	3
All Others .....	16

#### COMPRESSOR BEARINGS

Inadequate Lubrication .....	70
Overloading—Excessive Head Pressure .....	10
Poor Workmanship .....	10
Defective Material .....	5
All Others .....	5

#### CONTROLS

Poor Workmanship (loose connections, etc.) .....	30
Deterioration of Insulation....	27
Lightning or Line Surges.....	24
Moisture .....	9
Overvoltage .....	5
All Others .....	5

#### REFRIGERANT PIPING

Excessive Vibration .....	53
Overpressure .....	23
Fatigue .....	12
Corrosion .....	12

#### MAIN MOTOR BEARINGS

Inadequate Lubrication .....	71
Excessive Belt Tension.....	17
Poor Workmanship .....	6
All Others .....	6

#### AUXILIARY MOTOR WINDINGS

Foreign Material (dirt, oil, grease, etc.) .....	38
Single-Phase Operation .....	15
Non-Functioning of Centrifugal Starting Switch .....	15
Lightning or Line Surges.....	8
Low Voltage .....	8
Defective Material and/or Poor Workmanship .....	8
All Others .....	8

#### COMPRESSOR VALVES

Fatigue .....	50
Slug of Liquid Refrigerant....	25
Defective Material .....	9
Inadequate Design .....	8
All Others .....	8

### Neubauer To Head Copeland Engineering

SIDNEY, Ohio — Frank J. Gleason, president of Copeland Refrigeration Corp., announced the appointment of E. Theodore Neubauer as vice president in charge of engineering, in which capacity he will be responsible for engineering, research, and development, Gleason said.

Neubauer gained his refrigeration experience with York Corp. before the war and with The Trane Co. after the war. His major contribution was the development and design of modern, high speed reciprocating compressors, it was further noted.

## Satisfactory Cooling Service --

(Continued from Page 18, Col. 5) unsuitable oils or greases.

tinued in service beyond the normal anticipated life of the windings.

Since a reasonable amount of maintenance will prevent failures resulting from accumulations of foreign substances on the windings, it is believed that accidents from this cause should be regarded as inexcusable, while serious accumulations of dust, lint, oil, grease, and other substances can be prevented by periodic cleaning at regular intervals.

### Bearings

Bearings failed initially in 24% of the cases, with 77% of the bearing failures resulting from inadequate lubrication. "Inadequate lubrication" is defined not only as insufficient lubrication, but also as use of

Unsuitable oils or greases are those which are contaminated, of an inferior quality, or of an improper type for the particular application. Thus it is important to use only lubricants that are recommended by either the manufacturer of the equipment or by a reputable oil company consultant.

Even the most suitable oil obtainable may become sludged by the presence of water. Moisture enters the system whenever it is opened, and as a small amount of oil is always circulated through the system with the refrigerant, the oil may become emulsified by contact with the moisture. This will impair the lubricating qualities of the oil, and cause the formation of sludge.

Also, in the hermetically

sealed units, a comparatively small amount of moisture may break down the insulation on the windings of the main motor and cause them to short circuit and burn out. In addition, the moisture in the system may freeze, and then cause plugging of refrigerant piping, failure of the expansion control device, or reduced efficiency of the cooling coils.

Careless lubrication can result in deterioration of the insulation of main and auxiliary motor windings from oil or grease leakage, as well as bearing failures and other mechanical difficulties, and also lead to further damage. A bearing failure, for instance, may allow the rotor to rub the stator, allowing winding failure.

When motors are shipped from the factory, the ball bearings requiring periodic lubrication are generally packed with sufficient grease to last for a limited time. However, it is considered

good practice to add a small amount of grease soon after the unit is put in operation, and thereafter at suitable intervals.

In general, the bearing housing should be kept from one third to one half full. It is well to remember that excessive lubrication causes failures of ball bearings just as lack of lubrication causes failures of all types of bearings.

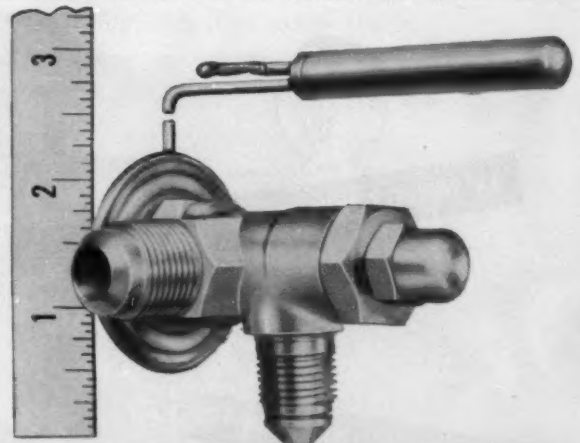
### Refrigerant Piping

Although failures of refrigerant piping accounted for only 10% of the total cases studied, it should be noted that 76% of such failures were the result of excessive vibration and overpressure.

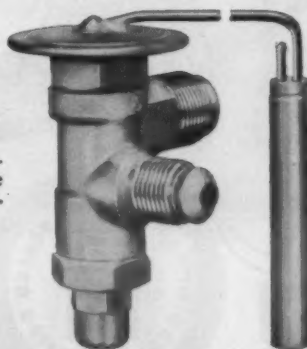
Any sudden increase in vibration of the unit or any part is sufficient reason for a prompt investigation. While the possible causes of excessive vibration can be complex and numerous,

(Concluded on next page)

Inch for Inch  
**DETROIT'S**  
NEW expansion valves  
give you the most...



# COMPACT CAPACITY



The new No. 718 Expansion Valve. Also available with external equalizer.



The No. 717 is a factory set valve of the same basic design as the No. 718 Expansion Valve. The No. 717 superheat setting is easily adjusted in the field before installation, with an Allen wrench through the inlet connection, to allow superheat settings other than standard. The adjusting screw is not sealed or soldered.

An entirely different concept in expansion valves—the completely new No. 717 and No. 718. Each of these valves is designed with a minimum of moving parts, to provide a more compact unit with greater capacity.

These new valves offer:

- **The Smallest Valves Per Ton Of Refrigeration**  
Broader use in more limited spaces.
- **Close Superheat Control**  
Minimizes surge for maximum valve operating efficiency.
- **Broad Range Of Application**  
½ to 3 tons R-12  
½ to 5 tons R-22  
L, C and Z charges available.
- **Easier To Service**  
Entire valve easily disassembled for inspection and cleaning.
- **Connection Sizes**  
¼ and ⅜ S.A.E. Inlet with strainer.  
½ S.A.E. Outlet.

For complete information see your DETROIT Wholesaler.

Detroit Controls Division of American-Standard, 5900 Trumbull Avenue, Detroit 8, Michigan.

Canadian Representatives: R. & E. REFRIGERATION & HEATING SPECIALTIES LTD., Montreal, Toronto, Winnipeg



## AMERICAN-Standard

DETROIT CONTROLS DIVISION



## Satisfactory Cooling Service --

(Concluded from preceding page)

the correction of this accident-producing condition is usually a rather simple matter.

Piping failures from overpressure were caused by improper operation of the shut-off valves in the cooling water lines with the result that the condensers were not provided with an adequate supply of cooling water.

### General

The designs of the main motor and the compressor of unit-type air conditioners are of two general types:

(1) Accessible or open and (2) hermetically sealed. In the accessible type the main motor and the compressor are separate components, belted or coupled. In the hermetically sealed type the main motor and the com-

pressor are built as one integral unit. Thus both the motor and compressor of the latter type are exposed to refrigerant vapors and heat of compression and are lubricated from the same oil reservoir.

When difficulty is experienced with either the main motor or the compressor of the hermetically-sealed type unit it is general practice to replace the complete assembly with a new or factory rebuilt assembly and to return the damaged one to the manufacturer's service shop for repairs or replacement. Thus, it is sometimes impractical for the company's inspectors to closely examine the damaged parts of such as assembly in order to definitely determine the direct cause of the failure. This accounts for the high percentage of causes of main motor winding

failures that necessarily have been listed in the "All Others" category.

When the main motor windings on hermetically-sealed type units become short circuited the acids formed and the burned insulation may enter the parts containing refrigerant. Therefore, it is important that the entire refrigerant circuit be thoroughly purged before a replacement main motor and compressor assembly is installed, and that the refrigerant circuit then be evacuated and recharged.

In both the accessible and hermetically-sealed type units there is always a small amount of lubricating oil circulated with the refrigerant. Therefore, before any check is made to determine the true operating oil level in the compressor, the unit should be operated for at least 20 minutes. (Too often the oil level is read when the unit has

not been operated for some time, and oil has returned to the reservoir, giving a false indication of the amount of oil required for safe operation.) The oil level should then be at the point on the sight glass or gauge, specified by the manufacturer of the unit as the normal operating level.

It should be noted that too high an oil level can result in an excessive amount of oil being circulated with the refrigerant. This condition will materially reduce the condenser and evaporator efficiencies by coating internal surfaces with oil which in effect insulates and retards heat exchange.

Air or other non-condensable gases in the refrigerant will cause excessive head pressure, possibly overloading of the main motor and bearings of the compressor, and also reduce the cooling capacity of the unit. Thus it is important that every

precaution be taken to keep air out of the parts containing refrigerant.

Many of the electric motors in unit-type air conditioners are provided with starting and running capacitors. Usually, the starting capacitor is connected in series with starting winding, and in the circuit only during starting, and the running capacitor is connected across the main terminals. These capacitors may fail from one of several causes: short circuits, open circuits, or weakening of the electrolytic chemicals.

If a starting capacitor fails by short circuiting, the current required for starting the motor will be excessive, the motor may not start, and overload protective devices will operate or fuses will be blown. Repeated attempts to start the motor will cause the windings to overheat and fail. When the starting capacitor fails by open circuiting, no current will reach the starting winding and the motor will not start.

If a running capacitor fails by short circuiting, the motor will start but fail to attain running speed and current will flow to the starting winding of the motor continuously. With the starting winding continuously energized, overload protective devices will remove the motor from service within a short time. When the running capacitor fails by open circuiting the motor will operate normally, but will draw more current when it is running.

### Conclusion

This study should indicate that while air conditioners can fail in numerous ways, only a little attention during operation and reasonable maintenance will pay dividends by greatly reducing failures and increasing the life of the equipment. Inspection and maintenance operations should be carried out at regular intervals, and should include the following:

1. Thorough cleaning of the complete unit, including, if necessary, motor windings, centrifugal starting switches, fan blades, face of cooling coil, condensate pan and drain, and return grille.
2. Inspection of all magnetic breakers, relays, etc.; adjustment, repair, or replacement as conditions observed may warrant; and a check for tightness of all electrical connections.
3. Proper lubrication of motor and fan bearings.
4. Inspection of all V-belts and proper adjustment of belt tension.
5. Check for leakage of refrigerant or compressor oil.
6. Inspection of air filters and replacement as conditions warrant.
7. Test run of unit for at least 20 minutes, and check for any indications of overheating, excessive vibration, unusual noises, or any other evidence of distress.

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## Safety Control Checks (Some Hints)

### 3 Ways To Control Temperature of Refrigeration System; Pressure Switch, Bulb on Evaporator, Control of Material

By Frank J. Versagi

TORONTO, Ont., Can.—“All safety controls should be checked frequently on shut-down conditions, since they seldom operate under normal conditions and may fail just when you need them most.”

This was the advice given by E. T. Coles, assistant sales manager of Penn Controls Ltd., when he spoke to the 19th annual convention of the Canadian Refrigeration Service Engineers Society on the subject “Control Systems for Air Conditioning.”

“Add such checks of safety controls to your list of routine service functions under the contract,” Coles continued.

Coles listed the three ways to control the temperature of a refrigeration system — pressure switch, temperature bulb on evaporator, and temperature control of the material.

#### MEASURES SUCTION PRESSURE

The pressure switch measures suction pressure and thus controls temperature within limits. Where a 40° F. temperature is desired, for example, and where it must be held plus or minus 2°, the cycling evaporator temperature may go from 26° to 38°. The corresponding suction pressure would be approximately 25 p.s.i. to 35 p.s.i.

If a temperature bulb were attached to the evaporator, it would be set to cycle at 38° to 26°.

If the actual product temperature were being measured it would provide quick response to changes and would cycle when the product temperature varied a few degrees.

#### SPECIFIC USES

“Each of the methods has advantages and disadvantages,” Coles stressed, “and each is best for specific applications.”

“The suction pressure switch, for example, is relatively inexpensive on units having fairly constant loads. It needs a fairly wide pressure differential to operate effectively. In the example above a 4° temperature differential required about a 10-lb. pressure differential.

“The pressure switch can be installed on the compressor by the condensing unit manufacturer and can be set as a moderate defrost system by cutting out above freezing,” he said.

“On the other hand, the pressure switch must pierce the refrigeration system which is undesirable on a hermetic system. The pressure switch is not suitable on multiple systems without evaporative pressure regulators.

“It is not suited to capillary tubes, or automatic expansion valves and cannot be used where the compressor is in a cold location. When ambient is colder than the evaporator, the refrigerant leaves the evaporator and collects in the compressor crankcase or suction lines during the off cycle. As a result the suction pressure does not depend on the evaporator temperature, but upon the total pressure in the evaporator.”

Under these conditions, Coles pointed out, the pressure switch will not get up to cut-in point, no matter how hot the evaporator becomes.

“Either the evaporator temperature control or the air (product) temperature control is satisfactory under these conditions,” he said.

“Most systems have a high pressure cut-out switch which may be a single control or may be combined in a dual control. Its function is to prevent dangerously high head pressures in the system; it also prevents overloading the compressor motor.

“Another important control is the water regulating valve, a simple device used to control water supply to the condenser and maintain proper head pressure and economize on the water. On air-and-water cooled jobs, the water regulating valve is so set as to supply water when air alone cannot do the job.”

Coles discussed some of the problems which may occur with water regulating valves, emphasizing the fact that dirt and foreign material in the valve is a major cause of faulty operation or failure. Much of this difficulty could be avoided, he said, if the serviceman or installer would take the time to

flush the valve thoroughly upon installation. Flushing should be continued for at least 5 minutes and all pipes leading to the valve should be pounded during the flushing to remove any loosely adhering foreign matter.

“Where continuous foreign material must be expected,” Coles advised, “install a separate strainer ahead of the valve. Where water conditions are extremely bad, the water regulating valve must be considered expendable — periodic inspection and replacement when needed.”

Explaining that the sizing of the regulating valve is highly important, he stated that “water regulators supplied by compressor manufacturers are often undersized for southern climates and oversized for northern service.”

Water hammer which can generate instantaneous pressures up to 1,000 p.s.i., according to Coles, creates shock

waves which harm bellows in the valves. Some valves have built-in shock wave absorbers, but where water hammer is a serious problem, special absorbers should be mounted.

On the subject of pressure lubrication, Coles emphasized that the protective control operates not on the oil pressure but on the differential between that pressure and the suction pressure.

“On a theoretical setup where we had a 30-lb. suction pressure and a 60-lb. oil pressure, for example, our protective control only has 30 lbs. to work with,” he said. “In practice we take about 5 lbs. off of that for a safety factor.”

Coles described briefly the operation of a lubrication protection control system warning that without such protection a unit could become permanently injured even by a temporary loss of oil.

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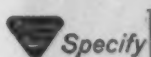
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## AROUND THE WORLD IN 50 DAYS

"Inside Dope" by GEORGE F. TAUBENECK



(Continued from Page 1, Col. 1) and a thief can't run far away. He has no place else to go but near where he is, unless he wants to swim the Pacific Ocean.

Even more important is the character of the native Hawaiian. Centuries of happy living in this obvious paradise have made him pleasantly uncovetous. He has everything he needs; why should he steal something from somebody else?

Nobody ever starves in the Islands. Nobody ever dies of overwork or shovelling snow.

An abundance of wild-grown food, sunshine and warmth, and mutual friendship have combined to make Hawaiian people exceptionally happy, helpful, affectionate, kind, and unselfish.

Although there aren't more

than 30,000 pure-strain native Hawaiians left in the Islands, most old families have some salubrious Hawaiian blood flowing through their veins.

As a matter of fact, Island aristocracy had its beginnings in judicious mixed marriages—chiefly between men from England or New England and lovely daughters of Hawaiian chieftains (who owned the real estate).

### Marrying for Land

Some 30 families are said to dominate the business and social life of the Islands. These are the families who possess sugar and pineapple plantations, important real estate, and Mainland commercial distributorships.

Their prosperity is predicated on the possession of land. And how was this land acquired? By marrying daughters of native Hawaiians. Shrewd Yankees or Britons married and re-married for more and more land until they obtained vast estates.

With this previously undeveloped property they created great wealth.

Probably nowhere else in the world is there so grand an example of a classless society as exists in Hawaii today, however.

Unskilled laborers and the higher ranks of salaried individuals enjoy better-than-normal living conditions. Same situation holds true in the case of managers.

In Honolulu a 20-thousand-



ADDRESSING the kick-off luncheon, planned by Hawaiian Electric Co. to help sell residential air conditioning, is George F. Taubeneck, editor of the NEWS.

dollar-a-year man lives like a New Yorker with an income of fifty thousand (or, equivalently, a millionaire).

### As Advertised

Perhaps the best thing one can say about Hawaii is that it won't disappoint you. It's "as

advertised" in the travel brochures. Almost everything about the place is fascinating and warming and comfortable and altogether cheerful.

While relaxing there you won't feel like arguing or fussing or fuming or fretting about anything or with anybody.

Rainbows day and night, sunshine which pours into your muscles like a golden liniment, gorgeous scenery, friendly and charming people—you name it, Hawaii has it.

Time doesn't mean much here. You don't care what day of the month it is, or what month of the year. There's only one season, and that's spring. Temperatures range from 65° to an infrequent 90°. Every day is May Day.

### There's Another Hawaii

Properly speaking, Hawaii is the largest island in the archipelago—a chain of islands which extends diagonally across the Pacific Ocean for some 1,500 miles.

On the southeastern end is the "big island" of Hawaii; on the northwestern end is tiny Ocean Island.

From a commercial standpoint, the Hawaiian Islands sift down to four: Hawaii, Kauai, Maui, and Oahu. (Others are Molokai, Lanai, Kahoolawe.)

Most travelers to the Islands never get to Hawaii itself, though. Honolulu, you see, sits atop a lesser island, Oahu.

So completely enchanting is Honolulu and its nonpareil Waikiki Beach that few visitors want to go any farther. But there's much grandeur and beauty in the other islands.

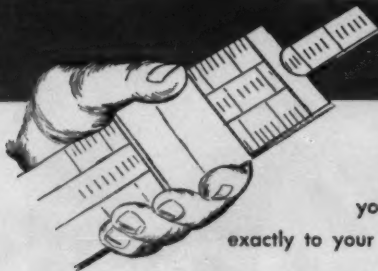
### Americanized Progress

Not until one has observed the still-primitive modes of living extant in other spots in the South Seas does one realize what has happened to the Territory of Hawaii—thanks to active American investors—in less than a century.

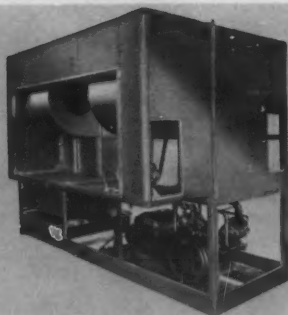
It was not until 1778 that  
(Concluded on Page 27, Col. 1)

Unusual air-conditioning needs? . . .

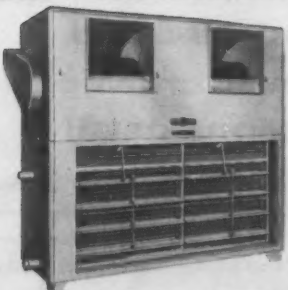
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Yes, working with numerous basic models, Governair will incorporate your specifications and modifications to SATISFABRICATE the package exactly to your needs. You can be sure of its quality, too . . . for every Governair unit is constructed by expert craftsmen. This is your assurance of dependable performance and exact fit. Why not consult us on your next air conditioning project . . . from 3 to 100 ton units.



SELF-CONTAINED MULTI-ZONE AIR CONDITIONERS—with evaporative condenser. Zoned conditioner section—hot and cold deck, with mixing dampers for each zone. Sizes 7½ to 80 ton—single or dual refrigeration circuit. Ready for simple connection to duct system.



FAN AND COIL CABINETS—cooling, heating, humidifying, dehumidifying, ventilating, 1 to 100 ton, 500 to 30,000 cfm, vertical or horizontal types. Governair multi-zone fan and coil units are available in sizes ranging from 5 to 80 ton capacities, suitable for individual zoning.

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or splashing liquids



**TYPE DP**  
1 to 125 hp

**with WAGNER  
TYPE DP MOTORS  
designed to meet more  
application needs**

Wagner Type DP Motors offer the *double protection* of rugged corrosion-resistant cast iron frames and drip-proof enclosures so well designed that the DP Motor can handle many applications that formerly required splashproof motors.

These Wagner Motors are built in the new NEMA ratings that pack more power in less space, are lighter in weight and are easier to maintain.

**SLEEVE BEARING MODELS AVAILABLE**

The entire line of ratings through 125 hp is available with ball bearing construction as illustrated, or with steel-backed, babbitt lined sleeve bearings that have high load carrying capacity and provide quieter operation.

Let a Wagner Sales Engineer show you how these motors can be applied to your needs. Call the nearest branch office or write for Wagner Bulletin MU-223.

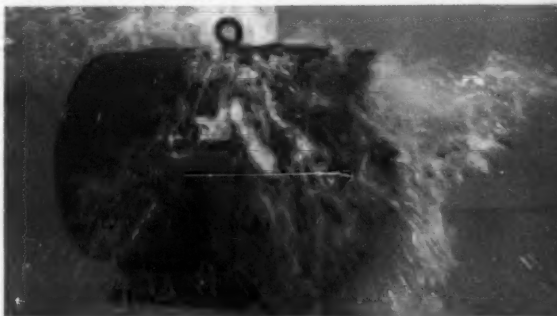
**1 to 125 HP—1750 RPM—40°C  
NEMA FRAMES 182 through 445U**

**Wagner Electric Corporation**  
6400 Plymouth Ave., St. Louis 14, Missouri.

WM58-9



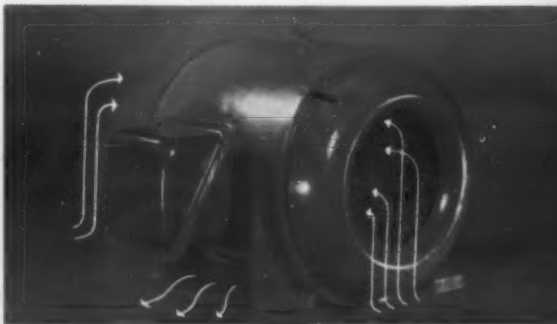
Air intakes and outlets are positioned to provide complete drip-proof protection.



**DOUBLY PROTECTED**—Wagner DP Motors offer the double protection of completely drip-proof enclosures and rugged cast iron frames that can take rough handling and resist corrosion.



**CAN BE RELUBRICATED**—Factory lubrication will last for many years in normal service—but openings are provided to permit the relubrication that adds years to motor life under severe conditions.



**COOL RUNNING**—Specially designed baffles direct cooling air through the motor to reduce stator temperature—thus increasing motor life. Blowers, cast as part of the rotor, move large volumes of air without noise or vibration.

**YOU GET  
EXTRA PROTECTION  
against corrosive...  
abrasive or  
explosive elements**



**TYPE JP**  
Explosion proof  
1 to 100 hp

**TYPE EP**  
Standard TEFC  
1 to 100 hp

## **with Wagner totally enclosed motors... protected for longer motor life**

If you need motors that will keep production rates up... that will give the continuity of service that is so important to automation... that will operate with complete dependability under the most severe conditions — Wagner totally-enclosed motors are your soundest choice.

Type EP Motors offer protection against corrosion, dust, abrasives, fumes, steel chips or filings. Type JP is explosion proof as well — designed and approved for use in explosive atmospheres.

**NEW NEMA FRAMES**—These motors are built in the new NEMA Frame sizes from 182 through 445U, with ribs that add mechanical strength and increase the surface cooling area. Effective cooling system adds to motor life.

Let your Wagner Sales Engineer show you how these protected motors can bring you savings on initial motor costs, maintenance costs and continuity of operation.

**1 TO 100 HORSEPOWER—4 POLE, 60 CYCLE—NEMA FRAMES 182 THROUGH 445U**

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#### **HEAVY DUTY BALL BEARINGS**

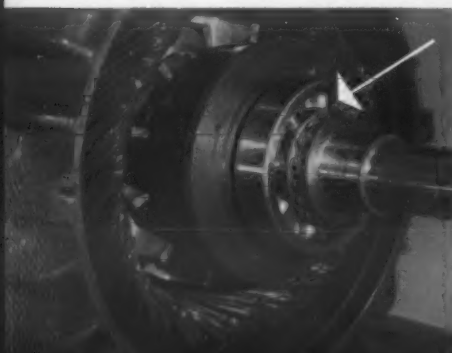
The ball bearings used in these motors are of the highest quality, with more than ample capacity to provide long troublefree service under heavy loads.

#### **BEARINGS CAN BE RELUBRICATED**

Factory lubrication will last for many years under normal service, but openings are provided to permit relubrication that adds years to motor life under severe conditions.

#### **SEALS KEEP BEARINGS CLEAN**

Both ends of these motors have running shaft seals to keep the bearings clean. Bearing housings are effectively sealed to prevent escape of grease.





## AROUND THE WORLD IN 50 DAYS

"Inside Dope"

By GEORGE F.  
TAUBENECK

(Concluded from Page 24, Col. 5)

Captain James Cook, first white man to set foot on the Islands, sailed around and over from Merrie Engleande. At that time native Hawaiians were living in grass shacks and grass skirts—just as they are supposed to do today in Tin-Pan-Ally songs.

Always aiming to please, real Hawaiians welcomed the "white gods," and paid them the compliment of adopting their customs. Missionaries (especially the Mormons) found them most amenable.

The missionaries codified the native tongue into an alphabet and a system of writing. And they sang—missionaries and natives together.

Especially did gospel songs like "Let the Lower Lights Be Burning" appeal to these lovers of simple music. Hymn books were more effective in winning the Hawaiians to Christianity than ritualistic prayer books or the Bible itself.

Princess Liliuokalani, composer of the world-famed "Aloha Oe" song, was the last native monarch. "Queen Lil" was a strong woman, determined and despotic, but she like to sing, too.

Moreover, American commercial interests had the situation well in hand, and in 1893 she was retired.

An independent republic was established which, in 1898, quietly annexed itself to the United States of America.

In 1900 the Islands were organized as a Territory, with a governor and secretary appointed by the President of the United States and an elective territorial legislature.

The first newspaper plant west of the Rocky Mountains was set up in Honolulu. Mark Twain once worked as a reporter on that sheet.

Robert Louis Stevenson, who paid court to the reputedly beautiful Princess Kaiulani, also wrote in Honolulu as did Jack London.

These are fine people. They deserve Statehood.

## Honor 2 at Superior's 20th Anniversary Fete

PITTSBURGH — Superior Valve & Fittings Co. recently celebrated its 20th anniversary here with a luncheon for all employees at the South Hills Country Club.

W. A. Siegfried, president, traced the progress of the company in a short address.

"We have grown," he said, "from a small assembly plant with one lathe and a few odd pieces of equipment, to a large manufacturing operation. Our customers are world-wide; our products are serving industries such as refrigeration, air conditioning, LP-Gas, and high pressure gases."

In tracing the company's employment record, Siegfried told the group that Superior has grown from 12 to 130 full-time employees.

"We are proud of our em-



LUNCHEON honors at Superior Valve & Fittings Co. were shared by Mrs. Mae C. Forbes, company secretary, and W. A. Siegfried, president. Mrs. Forbes' husband, the late John S. Forbes, founded Superior Valve & Fittings on April 18, 1938.

ployes," he continued. "For a company 20 years old, the average length of service per employee is 9.3 years. Of our 130 employees, 55 have been with us 10 years or more—27 have been employed more than 15 years."

Superior Valve was founded in 1938 by the late John S. Forbes.

## WHAT... WHEN... WHERE

— A Guide to Coming Events of Interest

Industrial Heating Equipment Association Meeting  
May 18-21, The Homestead, Hot Springs, Va.

Institute of Appliance Mfrs. Annual Convention, Exposition  
June 1-4, Netherland-Hilton hotel, Cincinnati.

Edison Electric Institute Annual Convention  
June 9-12, Boston.

Oil-Heat Institute of America Convention, Exposition  
June 9-13, New York City.

American Society of Heating & Air-Conditioning Engineers  
and American Society of Refrigerating Engineers JOINT  
MEETING  
June 23-25, Leamington hotel, Minneapolis.

## Amana Names Brocksmith Chicago Branch Manager

AMANA, Iowa — Frank O. vice president, sales, Amana Brocksmith has been named Refrigeration. Brocksmith, for the past 1½ years, managed the Cincinnati branch of Overhead Door Corp. and was associated previously with Crosley-Bendix.

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you need...

the **capacity**  
you want...

the **quality**  
you expect...



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BLU-COLD HERMETIC CONDENSING UNITS

Any size, from 1/5 to 2 H.P.

for any application, commercial or industrial. Send for new 4-page catalog sheet.

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Manufacturers of Open Type and Hermetic Condensing Units and Compressors.  
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the right man for a  
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Ads are read by your  
man.  
Place your ad today!

## 'Fiberscreen' Air Filters for Room Units Now Marketed Nationally for 98 Cents

CHICAGO—Now being distributed nationally by Fiber Bond Corp. is new low-cost "Fiberscreen" air filters made of "Dynel," the company announced.

First introduced at \$1.29 retail, single sheets of Fiberscreen filter material, packaged in polyethylene, are now priced to retail for 98 cents.

Designed to reduce retail inventory problems, the one-size filter replacement can be utilized

for all standard room air conditioners, according to the company.

Fiberscreen is produced of a special type of Dynel acrylic fiber made by Union Carbide Corp.

The "do-it-yourself" material is claimed to reduce necessity for frequent filter changes, to have high dust holding capacity.

"Easy Cut" filters are packaged in 1/2-in. thick 15 by 24-in. sheets which may be cut with scissors. Stiff cotton mesh backing makes the filter ready for use as is, it was explained.

The filters will soon be generally available in heavier thicknesses for use in large central heating and air conditioning systems and in forced warm air furnaces, according to the announcement.

**Operating Costs of Residential Air Conditioning and What This Means to Dealers and Installers.** By R. A. Gonzales—25¢ each.

Get your copy

Mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

## ARI Answers Questions on Room Air Conditioners: Size Needed, Capacities Available, Benefits

WASHINGTON, D. C.—A 16-page booklet — "Everybody Talks About the Weather — Now Look What You Can Do About It"—has been issued by the Room Air-Conditioner Section of the Air-Conditioning & Refrigeration Institute for general distribution.

Published with the aim of providing brief, accurate information on room air conditioners, the booklet is written in question-and-answer form and covers the benefits of air conditioning generally, advantages of room units, sizes and capacities available, how to estimate the size needed, and other information.

The booklet urges prospective buyers to seek the advice of reputable dealers on the capability of an air conditioning unit

"to do the job you want done."

It is expected that the booklet will be made available by manufacturer-members of ARI through their dealers and distributors.

Single copies are obtainable at 10 cents from Air-Conditioning & Refrigeration Institute, 1346 Connecticut Ave., N.W., Washington 6, D. C.

## Charleston City Hall To Get 1-Ton Room Air Conditioners

CHARLESTON, W. Va.—The city manager has been authorized by the Charleston City Council to purchase 12 new air conditioners.

The 1-ton units, for use in City Hall, will cost a total of \$2,376, it was stated.

## Installation of Hotpoint Portable Unit In 5 Minutes



FIT mounting bracket to inside of window channels making sure horizontal bar is at top and springs on side bars of mounting bracket are facing to outside of window.



PLACE unit in mounting frame in window. Slide spacer panel brackets on each side of air conditioner down so they fit tight against window sill.



CENTER unit in window using guide lines on spacer panel or by using a ruler so that each side of unit is equidistant from sides of window.

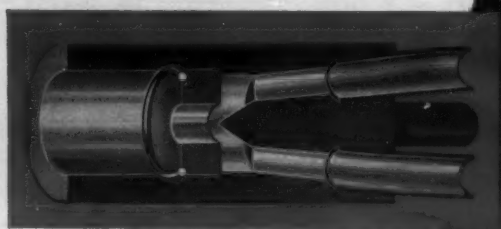


MEASURE distance from inside spacer panel brackets to inside of window channels on each side of window. Use guide lines on back of spacer panel. Cut spacer panel to correct size scoring along guide lines with a knife. Insert spacer panels in channels provided on spacer panel brackets and mounting bracket. Guide lines should be facing outside.



LOCATE top metal unit seals over spacer panels on each side of unit. Locate decorative front and attach. Close window on unit making sure metal seal on top is to the inside of the window. Plug in unit to adequately wired outlet. Actual time required for completed installation is four minutes, 45 seconds. If knife is dropped, or worker is slow, allow extra 15 seconds.

# get controlled distribution to every circuit



**BUY SPORLAN  
REFRIGERANT DISTRIBUTORS  
with the Famous  
INTERCHANGEABLE NOZZLE!**

the PEAK PERFORMANCE design with

## Over 19 years of Leadership!

And in addition... get these plus features that only Sporlan Refrigerant Distributors can offer. The Interchangeable Nozzle permits easy capacity control either at the factory or on the job. Coil manufacturers can stock coils with distributors already attached and select proper nozzles upon order. Visual, air, or test wire inspection at coil and distributor connections are simplified by merely removing the nozzle. They permit final coil pressure leak test without damage to the valve.

So... Get Controlled Distribution to EVERY Circuit, whether you need 2 circuits or 2 dozen... 1 distributor or a thousand. Buy Sporlan Refrigerant Distributors with the famous Interchangeable Nozzle for Peak Performance on all installations regardless of load or evaporator temperatures.

Better still... Install the famous Sporlan combination of Catch-All, See-All, Solenoid Valve and Thermostatic Expansion Valve along with it and get Peak Performance right down the line!

**SPORLAN VALVE COMPANY**  
7525 SUSSEX AVENUE ST. LOUIS 17, MO.

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## You're Forecasting Sales Anyway, So Why Not Use Better Methods, Prof. Tells Distributors

ST. LOUIS—Some specific suggestions on how an air conditioning outlet should go about forecasting its sales for the year, "which has to be done and is being done whether it's recognized as such or not," were offered to Typhoon distributors at a regional sales meeting here by Carl A. Dauten, professor of finance, Washington university, and business consultant.

That forecasting to some degree is being done by nearly every firm was emphasized by Dauten, who explained that setting up an inventory and ordering a stock of replacement parts and supplies or hiring additional salesmen is a "forecast" or perhaps only a guess on someone's part of the business a firm expects in the future.

His implication was that this type of forecasting is generally haphazard and should be replaced by a more logical and realistic approach. Here Dauten also cautioned against the use of a "gimmick or single factor" in forecasting sales because this will not work "in a complex society like ours."

In making a forecast the distributor or contractor has to consider (1) external factors over which he has no control, and (2) internal factors which he can control to a considerable degree, Dauten explained.

Included in the external factors, which must be looked at by the contractor from both the national and his own local level are:

- Industry growth trends in sales.
- Expected change in disposable income and consumer outlook.
- Price changes, if any, of equipment and installation.
- Change in residential construction.
- Actions of competitors.
- Weather.

Percentage and dollar in-

crease, or decrease, at both the national and local level should be determined as far as possible on each of these external factors, Dauten said.

Similarly, the contractor or distributor should carefully estimate the probable effect of changes within his own organization such as:

- Increased market emphasis on:
  - Present specialty markets.
  - New commercial.
  - Existing commercial.
  - Industrial.
  - Institutions and churches.
  - Existing residential.
  - New residential.
- More use of credit as sales tool.

3. Better planning of sales promotion.

4. Effect of modern sales management on:

- Increased salesmen.
- Better selection of salesmen.
- Improved training.
- Effective supervision and motivation.

From his analysis of the expected changes in both the external and internal factors affecting his sales, the contractor can arrive at an over-all forecast of his air conditioning sales in the coming year, according to Dauten.

Doing that is not quite enough, however, for the over-all sales forecast should be

What are the elements of "good management" for the air conditioning and refrigeration and heating dealer or contractor?

There are many elements that go into "good management" for this kind of a business, but it would seem that the three principal ones would be (1) the development of the kind of salespower that will develop enough sales volume to operate the company profitably and promote expansion; (2) proper control of expenditures and services to insure an adequate profit; (3) proper direction and handling of personnel to promote growth in the business and retention of good personnel.

In this series of articles the NEWS has drawn from a variety of sources to present some of the best current thinking on some specific elements that make for success.

broken down by individual product and model on a monthly or at least quarterly basis for the period is completed, thus operating with a year's forecast in advance at all times.

"All forecasts should be analyzed in retrospect," he also emphasized, "to determine, if possible, the reasons for all errors. Often, even when you're right it's for the wrong reasons."



design for utility



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VIKING utilizes the most advanced drawing and handling equipment known to the industry to deliver continuous coils of precision drawn copper tube in any desired length up to 2,000 feet... the type of coils supplied for specific design to suit customer requirements — reel type — helical — layer — bunch.

Annealing is done in controlled atmosphere electric furnaces of the latest design to give the required grain size within close tolerances, enabling the tube to be formed, flared, or expanded readily without danger of fracturing or splitting.

As coil specialists, VIKING is gaining the preference of more and more of America's leading manufacturers of refrigeration and air conditioning units and coils.

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The proper kind of temper is vital in tube used for refrigeration and air conditioning purposes. VIKING Copper Tube has been produced with the best available annealing and tempering equipment, thus assuring perfect fabricating.

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A battery of straightening machines keeps VIKING Copper Tube absolutely, unvaryingly straight. In addition, these machines precisely temper the tube, imparting to it the correct surface hardness... assuring ease in fabrication resulting in substantial savings in time and labor.

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Time  
by  
Jimmy  
Hatlo



## The 'Marketing' Approach to Successful Business Enterprise Management

MARKETING should mean a true alliance with "the fellow at the other end of the pipeline" (retailer or customer), according to Fred J. Borch, vice president in charge of marketing services for General Electric.

For our money, his definition states the case for the exciting new Marketing Concept as well as anything we've seen or heard.

Prior, outmoded "hard sell" concepts were concerned primarily with volume. Essentially they were selfish. Under the banner of marketing, however, the customer is the pivot point about which a business moves.

This shift, Mr. Borch points out, represents a return to the days before mass communication and statistical research turned selling into a cold process—days when businessmen knew their customers personally.

"Their businesses were customer-oriented because they knew this was the only way to run a business," he adds.

As any company grows in size and volume, its tendency to drift away from customers, and lose contact with them as individual persons, grows proportionately. Nevertheless, as its size increases, so does its need for awareness of customers' needs. The marketing concept is a modern-day recognition of this double-reacting situation.

Marketing as a philosophy rests on two key fundamentals. First is concentration on the customer's needs and desires, including those which the customer is not aware of, as well as those he feels consciously.

Only by identifying these personal needs can executives determine what each function of a business should do to satisfy customers.

**Second fundamental** of the marketing philosophy is rooted in profits and service. Sheer volume, obtained at the expense of competitors or customers (or both) can boomerang. Volume-for-the-sake-of-volume alone often is profitless.

Service (making buyers so happy that they'll become repeat customers) is the key to long-term profits and growth.

Three major economic trends are fostering acceptance of this new marketing philosophy. (1) Chances of error in planning are mounting, because the things "prospects" can buy are multiplying so rapidly. (2) The price of error is becoming ruinous because of the ever-mounting costs of tooling and distribution. (3) Demands on a company's internal communication and decision processes are straining the means of acquiring

all the information executives need to make sound decisions.

Use of the marketing approach (treat your customers' problems as more important than your own) can clarify responsibilities, improve profitability, and quicken the time lag between policy and action.

Nowadays the marketing manager operates as a general business manager. He shares responsibility for devising sales strategies, controlling finished goods inventories, and forecasting production needs.

Furthermore, he teaches his salesman to sell not the product or price alone, but the function and long-term usefulness the product performs. This lends further stability.

If adopted largely, this marketing philosophy can change the way of life in the world no less than did the First Industrial Revolution—or the Second (its handmaiden, automation).

Good teamwork is the answer to effective application of the marketing philosophy and methods. Traditionally the staff executive's chief problem is lack of authority.

However, the biggest headache for a marketing staff is not how to get its recommendations accepted. Rather, it is how to provide all the help which operating divisions request.

A marketing staff starts with the customer. An effort is made to find out what he wants, what he thinks, what he considers to be of value. This study is spearheaded by field salesmen.

Third comes product planning, a critical step indeed. It involves research, engineering development, manufacturing facilities and schedules, quality control, appearance, and design, packaging, simplification, and standardization—all studied alongside appraisals of competitive products.

**Programming—or detailing** of the plan of action—involves selling, advertising, promotion, public relations, and personnel development and training.

Who best can do what, when, where, and how—to assure that marketing plans are executed effectively—are decisions which should be made by men who understand the marketing "approach."

Final step is field sales action. And thus we come back to the customer, where the marketing process starts. You can't get away from the customer. He's your real boss. And he prizes SERVICE above price.

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AIR CONDITIONING & REFRIGERATION **NEWS**

F. M. COCKRELL, Founder

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VOLUME 84, No. 2, SERIAL No. 1,520, MAY 12, 1958



### 12,100 TONS OF COOLING 'RANKS SECOND'

Lone Star Gas Co.  
Dallas 1, Texas

in Virginia and the Merchandise Mart (8,500 tons) in Chicago.

Editor:

Page 5 of your March 3 issue carries a story reporting that the 6,000 tons of cooling capacity in the State Department building and its new extension ranks third in the nation for buildings under one roof.

Exceeding it, the story continues, are the Pentagon (14,300 tons) across the Potomac River

As a matter of information, I am sure you would like to know that the Convair Plant in Fort Worth has 12,100 tons of cooling capacity, and our engineers state that all of it is under one roof. This, I believe, places Convair in second place in the "under one roof" standing.

JIM CARLL

### LITERATURE EXPLAINS 'HEALTHFUL HUMIDITY'

Electrliving Corp.  
Indianapolis 5, Ind.

Editor:

Your March 3 editorial on the subject of humidity control is quite interesting. You might be interested in the enclosed sheet we have prepared to explain electric house heating and healthful humidity.

We enjoy reading your NEWS very much.

CLEMENT L. STANFORD,  
President

The air of the Sahara desert is more moist than the dry winter air people usually breathe in the homes. This very dry air dries out the furniture, skin, noses and lungs. Low relative humidity or dry air accelerates the evaporation of moisture from our skin and we "feel cold." A comfortable temperature of 70° is possible only if we also have the proper relative humidity of about 40-50%.

Statistics of the United States Public Health Service indicate the harmful effects of the excessive dryness of many heated buildings. During the months of average healthful indoor relative humidities of 40-60% about 2% of the people had respiratory disease. However, during the winter months with average indoor relative humidities of only 12-18% about 6 to 10% had respiratory disease.

Combustion type house heating plants require much oxygen to support combustion. In fact, approximately 22 cu. ft. of air are needed to burn about 1,000 B.t.u. of any fuel. Therefore, for example burning EACH gallon of oil consumes about 3,000 cu. ft. of air from home. This air must be replaced with new outside colder air as fast as the fire requires or else the fire will go out or the house will be "stuffy" and will fill with dangerous gases and obnoxious odors. Heating all this new air costs money AND readily lowers the humidity much below the healthful level.

Electrically heated homes do not have to breathe a lot of air just to be rapidly consumed in the heating plant. No air is used up—it is all left for the healthful, uncontaminated breathing of the children and other occupants. Since no air is consumed in the electric heating process, less air has to be heated and the cost is much less. Also, very importantly, the electrically heated house can be insulated much more effectively and tighter—thus greatly reducing the amount of heat required.

Since large volumes of new colder air do not have to be drawn into and warmed in the electrically heated home the humidity is not constantly de-

(Concluded on Page 37, Col. 1)





# NEW QUALITY! NEW VERSATILITY

and new profit oppo

LOWEST HIBOY LINE ON MARKET...ONLY 55" HIGH!



## NEW *Custom* OIL FURNACE

Conventional high-pressure gun burner and other standard parts permit easy servicing and replacement. Features quick-heating, "Vertifin" heat exchanger. Dependable safety features. Designed primarily for the builder market. The ultimate in smart furnace design—handsome as a kitchen appliance. Smallest model takes only 28" x 22" of floor space. All models fire-tested, assembled, and wired at factory. "Grows" into year 'round air conditioning. Can be converted to gas. BTUH output: 84,000 to 168,000 upflow—84,000 to 112,000 combination horizontal-downflow.

ALL-NEW  
FURNACE  
LINE

## NEW *Imperial* GAS FURNACE

Combines all of the most advanced General Electric safety, engineering and design features: G.E.'s famous cast-iron "Pinpoint" Heat Exchanger for quicker, more economical heat; simplified wiring, quiet performance, rugged construction and smart, two-tone gray styling. No need to hide this handsome furnace. Smallest size takes only 21" x 30 1/8" of floor space. The Imperial easily "grows" into year 'round, whole-house air conditioning. BTUH input: 90,000 to 210,000, upflow—75,000 to 150,000, downflow.



## NEW *Custom* GAS FURNACE

Designed and priced especially for the builder market. Smallest unit takes only 15" x 28" of floor space. Minimum clearances approved by A.G.A.: sides, rear and combustible flooring, zero clearance—front and flue, only 6"—only 1" above plenum. Ideal for closet installation. Simplified wiring, quiet blower, advanced cast-iron burner design, "Thermal-Trap" heat exchanger. Priced competitively with ordinary furnaces. Two types—one for normal heating and air conditioning, one for above-average cooling loads. BTUH input: upflow and downflow, 75,000 to 150,000.

"GROW" INTO  
YEAR 'ROUND  
AIR  
CONDITIONING

# TY! NEW PERFORMANCE! NEW PRICE!

opportunities for you!

## ALL NEW COOLING LINE FOR AIR CONDITIONING



### NEW COOLING COILS FOR "ADD-TO" YEAR 'ROUND AIR CONDITIONING

Two types—TXA (Type "A") for low headroom, upflow or downflow—TXF (Flat) for upflow, downflow, horizontal, and parallel. These are the coils that make it easy to convert all new General Electric Warm Air Furnaces into year 'round whole-house air conditioning. With their matching enclosures, they provide optimum versatility and adaptability. Control options available for builder market, modernization-replacement market and cooling-only applications. Simple to install—smartly styled. Broadens the residential market—opens new commercial markets. BTUH capacities: 22,500; 24,000; 33,000; 40,000; 53,000 and 63,000.

**GENERAL**  **ELECTRIC**



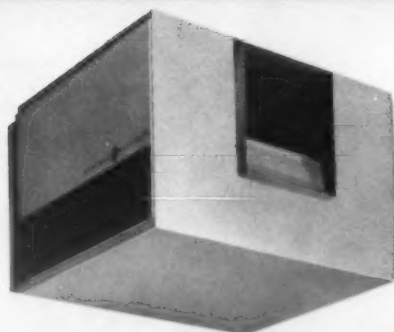
### NEW AIR-COOLED PACKAGED COOLING UNIT

Compact, handsome, self-contained air conditioners for new or old homes with or without duct system. Decorative diffuser-filterframe for commercial in-space installation. Uses no water. Easy to install in attic, crawl space, basement, or hallway—on roof, through transoms, on slab, or through wall. Protected for low and high pressure. Efficient, man-sized compressor easily cools an entire home, store or office. Quiet performance. Ideal cooling unit for modernization-replacement and commercial market. Capacities in BTUH: 24,000, 30,000 and 36,000. Gives you a big advantage over competitors who are limited to using a larger-size unit.



### NEW REMOTE AIR-COOLED CONDENSING UNIT

Factory-sealed, air-cooled and weatherproofed. May be installed almost anywhere indoors or out—on roof, on slab, in garage, attic, crawl space—for use with either of the General Electric Air-Handling Units listed below. Ideal for commercial, industrial, and residential use. BTUH capacities: 22,500; 24,000; 33,000; 40,000; 53,000; 63,000 and 75,000.

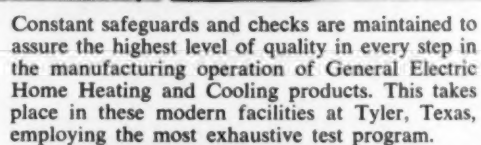


### NEW AIR-HANDLING UNITS

The TE500AH is shown above right with the optional air diffuser and decorative trim attached. This handsome unit, together with the TE300AH on its left, represent high styling in the functional, architectural look so important in modern installations. They provide maximum comfort in both residential and light commercial applications when teamed with a remotely installed General Electric Air-Cooled Condensing Unit up to 63,000 BTUH.





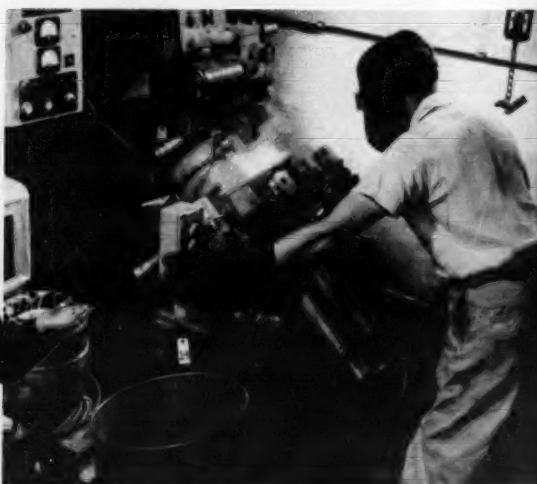


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QUALITY CONTROL  
ASSURES  
DEPENDABILITY**

**Famous General Electric Warranty  
Protects You—And Your Customers.**

**On Furnaces—10 years on heat exchanger—one year on entire unit.**

**On Cooling**—5 years on compressor and all refrigerant circuit components connected to it permanently at the factory.



Typical of General Electric quality control measures are the precautions taken in the assembly of the compressor... the most exacting part of the manufacturing operation. This room is closed off from the rest of the plant and pressurized to keep out dust. Humidity is carefully controlled to minimize moisture. Its highly varnished, edge-grained, wooden floor is vacuumed twice daily to prevent contamination of vital compressor parts.

A true hermetic seal is applied to the compressor to provide air-tight operation throughout the life of the unit. The compressor is automatically welded in a carbon-dioxide atmosphere. Result is a steel-to-steel seal in place of outdated arrangements of nuts, bolts and gaskets. This means a more dependable unit without chance of leakage around the seals.



ALL PART  
GENERAL  
BLUE PRINT FOR LEA

These quality products are only the beginning. There will be more to come—way—the latest developments in heating and cooling products for homes, offices and factories. For General Electric's Blueprint For the Future, call for a continuing program of new product development, financing plans, national and local advertising—the complete package to assure a leadership position for General Electric dealers in the future with General Electric? Contact your nearest General Electric distributor today. You'll find him listed in the yellow pages of your phone book.

*Progress Is Our Most Important*

**GENERAL**  **EI**

**Air Conditioning Department, T**

RE-00-2991

# WHAT'S NEW in GENERAL ELECTRIC home heating and cooling?



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LEADERSHIP PLAN

will be more coming your  
products for homes, stores,  
For Leadership Plan calls  
ment, sales training aids,  
the best of everything to  
dealers. Why not plan *your*  
General Electric Distributor  
your telephone directory.



Important Product  
ELECTRIC

at, Tyler, Texas

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# EVERYTHING'S NEW!

GENERAL  ELECTRIC







## OFF THE CHIEF

(Concluded from Page 30, Col. 5) pressed. Furthermore, being much better insulated, the electrically heated home retains much of the moisture produced in normal living habits to maintain a constantly healthful humidity of 40-50%. A family of four can produce the following average amounts of moisture in a home each day: Dish washing, 1 pint; Showers, 1 pint; Clothes washing, 5 pints; Cooking steam and combustion, 5 pints; Breathing and perspiring, 12 pints; Drying clothes, 26 pints. Total of 50 pints or 6 1/4 gallons.

A well insulated home with its greatly reduced "blow-through" retains much of the moisture produced within a home. Ventilating fans in bathroom and kitchen can readily remove any excess moisture or odors. They may be controlled manually or with a humidistat set to start the fans automatically at a predetermined setting of relative humidity—automatically stopping within very close range of the desired moisture content of the air in the home.

### SEE ISSUE OF JUNE 17 LAST

National-U.S. Radiator Corp.  
Baltimore 18, Md.

Editor:

As a subscriber to the NEWS publication, I am happy to report that your articles are read with great interest and most issues are retained for future reference. A question has come up with regards an air curtain wall, to be used in lieu of swinging doors normally employed in markets, etc. If memory serves me correctly the NEWS carried an article on this subject in one of your recent issues.

In going through my scrap-book I cannot locate this article. Can you send a duplicate of this article or advise the writer where we may obtain additional information on this subject?

R. J. SMITH

Editor's Note: The most recent article on this subject appeared in the June 17, 1957 issue on Page 29.

### DECRIES 'PART-TIME CHISELER MECHANICS'

Brighton, Ill.

Editor:

I would like to know what can be done about these so-called shade tree mechanics. A couple of days ago I had to repair a deep freeze which didn't have too much wrong with it.

The customer had just finished spending over \$100.00 to have the freezer repaired and still had the same complaint when he called me. The repairman that worked on the freezer before me is a factory employe doing refrigeration in his spare time.

Not only do these part-time chiselers try to "take the customers," they give the customers good deals on parts by selling at wholesale prices.

I have spent three years trying to work into a small

neighboring town because of these chiselers, and still haven't done too good. I would like to see the service shops, unions, and parts houses work together and stop such goings on as this. . . .

DONALD FEILBACH

### CAN ANY OTHER FIRM BEAT THIS?

The Harry Alter Co., Inc.  
Chicago 16, Ill.

Editor:

Sitting here in the waning hours of the afternoon, thumbing thru the latest issue of NEWS, it just occurred to me that since coming back from service, in the Fall of 1946, we, (The Harry Alter Co.) have

run an "ad" in your wonderful publication every week without a miss for over eleven years, thus accumulating a total of approximately 600 continuous ads! Should this record make us eligible for the honor roll?

Seriously though, I was just wondering if any of your other advertisers has an equal or better record than ours in the number of continuous ads placed in your publication. Could you satisfy my curiosity regarding this—I'd sure like to know.

Another thought occurring to me is, how much of our continued success and growth can be attributed to continuous advertising week after week in one publication—got any idea?

In any event, I certainly hope our pleasant relations will continue for years and years to the mutual benefit of both our companies.

JOE NOVOTNY,  
Vice President-Advertising

### IDEAS ON ELECTRIC HEATING COSTS

Potomac Electric Power Co.  
Washington 4, D. C.

Editor:

Reference is made to the editorial entitled, "Panel Heating Shows Promise" in the March 17, 1958 issue of AIR CONDITIONING & REFRIGERATION NEWS.

The last paragraph states that the initial cost of electric heating may be comparatively high. While it is admitted that when installing electric heat in a home, savings mount up on such things as the elimination of chimneys, ductwork, or hot water piping, it is usually true that more insulation is added to increase the total cost.

In spite of this, the initial cost in our area has not been comparatively high.

It is also stated that operating costs could be appreciably less than that of other sys-

tems. The statement may depend on special rates applied by the utility; however, many utilities do not offer such rates.

D. A. SACAROB,  
Junior Engineer

### COMPANY WANTS TO REPUBLISH EDITORIAL

Sunset Electric Co.  
Spokane 2, Wash.

Editor:

I have just read your editorial in the April 21 issue of AIR CONDITIONING & REFRIGERATION NEWS.

I believe this a very good and timely editorial and would like to have your permission to reprint it in one of our circular letters, which we send out to dealers. We would give you and your paper credit for the article.

Please let us know if we have your permission.

GEORGE W. ALBERTS,  
Service Manager  
Frigidaire Div.

**FREE!**



Valuable Information! Improved Procedures for Cleaning and Dehydrating Refrigeration Systems

Get this 12-page illustrated booklet describing effective new procedures for dehydrating sealed and open type systems, in the shop and on the job. Mail coupon or write Frigidaire, Dayton 1, Ohio.

Service Department 1006  
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Send FREE booklet on cleaning and dehydration.

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## New Frigidaire ULTRA-SORB Thuro-Driers

lick moisture problems  
— once and for all!

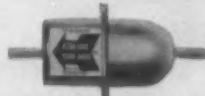
Why risk faulty operation and costly call-backs due to inadequate dehydration of refrigerant lines. It's so unnecessary — when you can easily remove harmful moisture with new Frigidaire Ultra-Sorb Thuro-Driers. More important, the system stays dry, even when the Thuro-Drier is installed in hot motor compartments. Ultra-Sorb Thuro-Driers are a cinch to use — in the shop or on the job. And there's a size just right for every application, from household refrigerators and other sealed capillary systems to multi-ton air conditioning installations.

Get an assortment, in the sizes you use most, from your Frigidaire District Office.

A COMPLETE LINE FROM ONE SOURCE MEETS ALL YOUR DEHYDRATOR NEEDS



Solderless, flare, and sweat fittings



For capillary systems



1/2 to 20 H.P. capacities

### ULTRA-SORB DRYING AGENT IS BETTER three ways:

1. **More Soak-Up Power**—It can adsorb more moisture, more acids and salts, than other materials used for this purpose.
2. **Holds Up Under Heat**—No loss of capacity even at high temperatures, when other drying agents release moisture back into the system.
3. **Minimum Pressure Drop**—Ultra-Sorb drying agent is in the form of clean, hard beads — does not break down. Leave it in the system — no call-back.



Matching Frigidaire Refrigerant Control Valves

Expansion and cooling unit control valves to assure finest performance of any refrigeration system.

**FRIGIDAIRE**  
Ultra-Sorb THURO-DRIERS



Frigidaire—Built and Backed by General Motors



## FOR MORE INFORMATION ON THE PRODUCTS DESCRIBED ON THIS PAGE

Write Directly to the Company—at the Address Given in the News Item

Air Conditioning & Refrigeration News, May 12, 1958



### Offers Isometric Drawing Forms

A complete line of isometric drawing forms for all types of layout work in the air conditioning and sheet metal field have been developed by Iso Pad Co., Dept. AC&RN, 11325 Long Beach Blvd., Lynwood, Calif.

These forms are put in 80 sheet pads printed in light green ink and are available in 1/4 and 1/2-in. isometric.

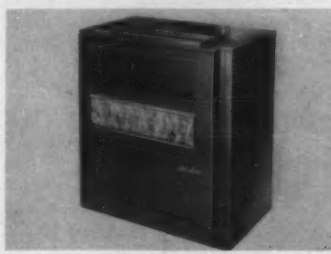
Scale layout work can be done in the field as well as in the office. Also available is 1/4-in. isometric on reproduction paper, printed in light blue ink, which does not reproduce if a print should be made.

### Develops Compact Central Air Conditioner

"Hide-Away" cooling unit is a central unit which tucks away out of sight in attic, basement, utility room, garage, or closet, according to the manufacturer. Burnham Corp., Dept. AC&RN, Irvington, N. Y.

Compact, it requires 6 sq. ft. of floor space. It is designed to distribute cool air to rooms most in use, and avoids cooling little-used rooms.

Minimum ductwork is required. In one story structures with a central hall, for example, the Hide-Away unit is placed in the attic

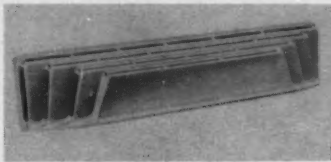


above the hall, and the ceiling is dropped to form a distribution or plenum chamber with cooled air going directly into rooms.

### Perimeter Diffuser Can Be Adjusted

A new perimeter diffuser that's adjustable-for-heating or cooling, has been announced by Titus Mfg. Corp., Dept. AC&RN, Waterloo, Iowa.

Called the model P-125, this new diffuser requires only fingertip adjustment to change the air flow.

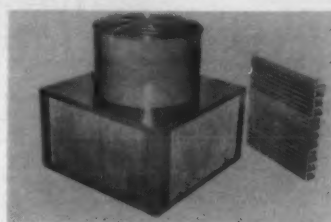


### Announces 'Install-It-Yourself' Central Unit

"Install-it-yourself" central unit air conditioner has been announced by Kool Engineering Corp., Dept. AC&RN, 1320 N. Clybourn Ave., Chicago 10.

It can be installed in homes, offices, stores, apartments, and factories. Complete system includes condensing unit and evaporator coil plus copper tubing, "Freon" gas, and installation instructions. The condensing unit is installed either outside the building or in basement.

Evaporator coil mounts in hot



air furnace or air duct and is connected to condensing unit with copper tubing. Cooling capacity is 2 or 3 tons, air or water-cooled.

### Designs Portable Electric Dehumidifier

"Comfort-Aire" automatic "Deluxe" DHA-70 electric dehumidifier has been announced by Heat Controller, Inc., Dept. AC&RN, Losey at Wellworth, Jackson, Mich.

Portable, unit is designed specifically for residential basements, may be placed over the floor drain. Suggest price is \$129.95. Built-in humidistat turns unit on and off.



## heat pump

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by **Gibson**

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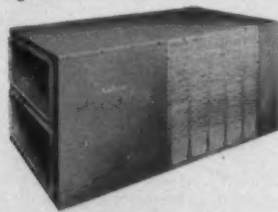


### Gibson packaged air cooled air conditioners

**Model GO-21A** — Full 2 H.P. Delivers rated capacity of 22,000 BTU/HR at ARI standard conditions. Easily installed. Can be used with or without duct work.

**Model GO-31A** — (Illustrated) Full 3 1/2 H.P. Delivers full rated capacity of 35,000 BTU/HR at ARI standard conditions. Has two 1 1/4 H.P. compressors. Can be used with or without duct work.

**Model GO-50** — Full 5 H.P. Requires no water, cools even the largest homes. Equipped with two 2 1/2 H.P. compressors for maximum efficiency, low operating cost.



### Gibson packaged thermomatic heat pumps

**Model GO-21AH** — Capacity for cooling at ARI standards 21,000 BTU/HR — for heating 50,000 BTU/HR\*. Light weight, easily installed.

**Model GO-31AH** — Full 3 1/2 H.P. Can be used with or without duct work. Has two 1 1/4 H.P. compressors that deliver full-rated capacity of 34,000 BTU/HR for cooling, 77,000 BTU/HR\* for heating.

**Model GO-50H** — (Illustrated) Full 5 H.P. Equipped with two 2 1/2 H.P. compressors that will deliver full-rated capacity of 48,000 BTU/HR for cooling, 108,000 BTU/HR\* for heating.

\* At 45° outside temperature, with supplementary duct heater.

### Window Air conditioners and Heat Pumps by Gibson

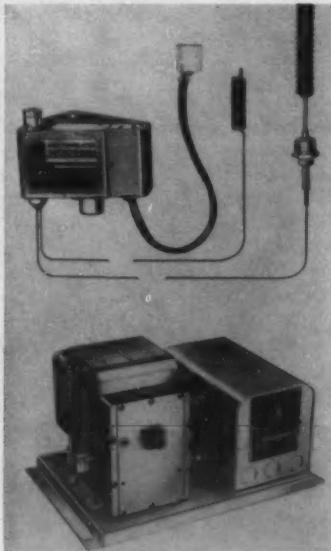


You're in the heating and cooling business with both feet when you handle Gibson. In the new line of Gibson window units, there's an air conditioner and heat pump for every purse and purpose. Get the complete story on both types of units from your distributor.

### Transport Insulation Resists Slumping

A new insulation product for the transportation field which resists slumping, is claimed high in thermal efficiency and is easy to handle, has been announced by Owens-Corning Fiberglas Corp., Dept. AC&RN, National Bank Bldg., Toledo.

Known as AT-400 series transportation insulation, the new Fiberglas product is designed for installation in trucks, busses, railway cars, and other common carriers.



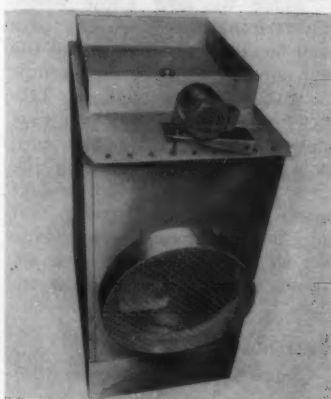
### Has Positive-Acting Control Package

The control package which may be applied to any conventional classroom type electric heat unit ventilator has positive-acting step control which eliminates the necessity of variable voltage regulators and magnetic contactors in the control of electrical input to the heating elements, according to manufacturer, the Barber-Colman Co., Dept. AC&RN, Rockford, Ill.

Package consists of a dual element thermostat which provides control of both room and discharge air, an electric motor operator to position heater control switches, and outdoor and return air dampers to provide standard unit ventilator control cycle Y, and a step controller for control of heaters. Control package is completely pre-wired, the company further explained.

get going... get **Gibson**



**Offers Commercial, Industrial Cooling Towers**

A new line of induced-draft water cooling towers for use with commercial and industrial air conditioning systems and especially designed to occupy minimum floor space has been introduced by Mason Products, Inc., Dept. AC&RN, 317A Main St., West Concord, Mass.

Designated the "Hydra-Glide line," the towers are available in capacities from 8 to 75 tons. The 8-ton unit, model 3108, operates in 10.2 sq. ft. of floor space, while the 75-ton tower, model 3175, functions in 47 sq. ft.

Each is pre-assembled at the factory. Slip-fit type joints are used in the tower casing.

**Blowers Push Air At High Pressure**

A new series of turbo-pressure blowers, designed to furnish air at high pressures for use with oil

and gas burners on industrial furnaces, scale blowing, and air curtains, has been announced by Chicago Blower Corp., Dept. AC&RN, 9863 Pacific Ave., Franklin Park, Ill.

New blowers are designed to maintain a constant pressure while supplying varying volumes of air. The blowers characteristically demonstrate a power-consumption curve closely proportional to the amount of air used or delivered, the company explained.

Designed for high speed to reduce space requirements to a minimum for a given duty, the rotating elements of the blowers are of light weight, high strength construction.

**Food Handling System Available In 4 Widths**

"Series M" food handling system includes cabinets in both food warming and frozen food range, as well as standard temperature refrigerators, according to the manufacturer, Koch Refrigerators, Inc., Dept. AC&RN, 401 Funston Rd., Kansas City 15, Kan.

Available in four section widths, in single front or pass through arrangement, and with many other options. Regardless of variations, two or more cabinets may



be joined together or the individual units may be placed separately anywhere within the kitchen.

**Adds 'Wall Remote' Drinking Water Cooler**

A new "Wall Remote" type drinking water cooler has recently been added to its line by Temprite Products Corp., Dept. AC&RN, E. Maple Rd., Birmingham, Mich.

Known as model WR-5, it is designed for built-in applications within building walls. The cooler can be incorporated into new or old building designs.

Model WR-5 is complete with a hermetically sealed compressor, and a 1/8-hp., fan-cooled condenser.

**Introduces Controls Field Conversion Kit**

selector switch unit with three color-coded lead wires, a pair of spring clips for attaching a pushbutton, and easy-to-follow instruction sheet showing wiring diagrams.

A simple compact field conversion kit for installing pushbutton and selector switch pilot controls on Furnas Size 0, 1, and 1 3/4 magnetic starters has been introduced by Furnas Electric Co., Dept. AC&RN, 1000 McKee St., Batavia, Ill.

Designed for easy installation, these kits contain pushbutton or

**Template Scaled 1/8-In. to 1-Ft.**

A new pocket-sized, clear vinyl drawing template scaled 1/8 in. to the foot has been developed by Mercury Automatic Checkstands, Inc., Dept. AC&RN, 135 E. 35th St., Los Angeles.

Template contains many reference guide lines and dimensions for establishing proper aisle clearances and necessary floor electrical outlets, cash register stand, etc.

A setup for three units is provided on the 2 1/2 by 5-in. unit with complete instructions and all reference material color-printed for easy reading and quick use.

**Markets Aluminum Utility Tube**

Introduction of "Versatube," an aluminum utility tube which will be marketed through plumbing, heating, refrigeration, and other wholesaler outlets, has been announced by Wolverine Tube, Div. of Calumet & Hecla, Inc., Dept. AC&RN, 17200 Southfield Rd., Allen Park, Mich.

It will be packaged in master cartons for protection in a range of standard sizes from 1/2 to 3/4 in. O.D. in aluminum drawn tube.

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## Electrical Testing Information

## Uses Test Cord, Amprobe, Volt-Wattmeter, Ohmmeter In Servicing Sealed Units; Cautions on Problems Involved

By Frank J. Versagi

MINNEAPOLIS—While the servicing of sealed units includes refrigeration performance, mechanical repair, and electrical checking, the service engineer has most difficulty with electrical components, according to Edward Asproth, Asproth Refrigeration.

Speaking to the Upper Midwest Regional Association of Refrigeration Service Engineers Society, Asproth presented electrical testing information "as I would use it, not as a lab setup."

"We use four devices either alone or in combination. They are the test cord such as sold by Kelvinator, the amp-

robe, volt-wattmeter, and ohmmeter. With a little care these instruments will stand up in service vehicles. This does not mean that you can throw them in the back of a pick-up and go down a wash-boardy road for 20 miles and expect accuracy.

"The simple test cord will stand the most and if used correctly will about do all the testing you need.

## Understand Internal Make-up of Unit

"Before we can apply the service test cord on the motor compressor assembly, we must have a basic understanding as to the internal make-up of the

unit. I am thinking of single-phase equipment where we have a starting winding and a running winding in this welded or bolted shell with three leads coming through the case. These represent the common connection or terminal, the starting winding known as either starting terminal or phase winding, and the main or running winding marked 'C' common, 'S' or 'P' for start, and 'M' for main.

## How To Determine Unmarked Terminals

"Many of these terminals are not marked and we must be able to determine which is which. If you have done this

many times then we know where they are, this is experience. We can look on some relays, trace the wires, and identify them. A wiring diagram on the back of the cabinet will help. I carry a color code chart made for this purpose. The All Makes Service Manual has a section identifying the terminals.

"If the leads have been disconnected it will then be necessary to use an ohmmeter. To do this, make sure that there is no power connected anywhere. The instrument measures resistance between the terminals. Take three readings. When you have the ohmmeter terminals on the two posts that give you the highest resistance, the remaining post is the common terminal. Shifting the one ohmmeter lead to this post one can determine the start and run. The start winding has the higher reading, and the run the lower reading. There is one model of

Norge about 1941 that the start winding has the lower reading.

"Since we now know where the terminals are, we can proceed to check the unit using the test cord. The wires on the unit must be disconnected. A 110-volt light bulb placed in the fuse socket. By using the test cord as a series test light with the cord plugged into a 110-volt power supply and using test cord leads marked common and run as test probes, a check between terminals will show an open.

## 'Best Way Is To Check on Tubing'

"With no open, check between any terminal and ground. The best would be to check on the tubing as usually there is no paint on the copper. If an open circuit or a ground is indicated, it means at least a unit change. In the bolted type construction perhaps a stator change will be sufficient.

"Should your tests indicate a good unit then replace the bulb with a 10-amp. fusotron or larger if the current draw of the unit is more than 10 amperes normally. Be sure that the test cord is unplugged before you make this change. Connect the test cord leads to the respective terminals as marked on the test cord. If the unit is a split-phase motor, clip together the leads on test cord marked capacitor. If capacitor-start motor connect the capacitor leads to the proper size capacitor instead.

"Hold the momentary switch in the on position and plug in to a power source and the unit should start. Release the momentary switch. The unit should run. A current draw check can then be made on the common lead of the test cord, while the unit is running.

## Short Indication

"A blown fuse or heavy current draw would indicate a short between windings. The momentary switch should not be held in the on position for more than three seconds; usually one second will be enough.

"Should the unit fail to start with the above test, use a capacitor on the test cord capacitor leads and reverse the run and start connections on the unit, for a momentary start; then try to run the unit again using the proper connections. This is a means of reversing the rotation of the stator and will perhaps break a stalled rotor or compressor. If this fails, replace the unit.

"The test cord and amprobe—using the amprobe as a voltmeter—can also be used to make the preceding test as to opens and grounds. This will give a more accurate check on the grounding of a unit.

## Check Unit's Grounding

To do this connect the test cord terminal marked run to any terminal of the unit and the common lead to one lead on the amprobe. Using the remaining amprobe lead, check for either opens or shorts to ground. Any reading to ground of over 25 volts is considered not safe though the unit may run.

"The ohmmeter can perform all the foregoing checks made without the use of a separate

(Concluded on next page)



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## Electrical Testing--

(Concluded from preceding page) power source. It will check continuity and grounds. By using the highest scale on the meter a very slight leak to ground will be indicated.

"Internal shorts between windings can also be determined as the windings have different resistances. This instrument must be taken care of and not one that can be roughly handled, therefore it is not too practical to use in field service.

"The wattmeter measures the amount of wattage being drawn while the unit is in operation, and also includes the proper power factor. The wattmeter can check the wattage but unless you have a table for the equipment being tested or a stamped wattage for the particular application it does not have the answers we need.

"An approximate wattage can be determined by knowing the voltage and current then multiplying the two values and assuming 70% power factor. Thus a unit that is stamped 5 amperes at 110 volts should read 385 watts.

"Assuming that trouble is electrical, this narrows it down to controls, overloads, relays, capacitors, etc.

### First Check for Failure To Hear Response

"My first check for failure to hear any response would be the power supply. By opening the door the light should be on or a fan running. If this is OK then I would short out the control. However, this may be done automatically as when the unit attempts to start. Then neither control nor power needs checking. In this case—if it were the capacitor type of motor—I would check the capacitor before checking if the unit is at fault.

"Having leads already soldered on several size capacitors and selecting one of the proper size, I would hold the two leads across the old capacitor while the unit is attempting to start. If the unit starts I have located the trouble. If the capacitor is shorted then one leg has to be removed first. In this case I would check the unit before removing the old capacitor.

### 3 Types Relays

"There are three types of relays, the hot wire, the magnetic, and the potential or voltage type. The hot wire is the most simple—having three dead posts marked 1, 2, 3, with L for line, M for main, and S for start. This has a calibrated wire that expands with an increase in heat or current flow. It serves as a starting device and overload. The starting contact is closed at start and opens shortly after a second or so. If an overload occurs or the unit fails to start the second contact opens and breaks the circuit for a period of time.

"The magnetic relay is made in several styles all of which may or may not have overloads but in all cases have the starting circuit normally open. The inrush of current causes the magnetic pull that makes the starting circuit complete.

"The potential type must be used only on capacitor-type

motors. These are not affected by current therefore one relay may operate many motor sizes, whereas the other two are sized for each motor size."

Returning to the subject of capacitors, Asproth explained that while it is possible to use two 110-volt capacitors in series for a 220-volt system, the total capacitance must be watched.

When capacitors are used in parallel, he showed, the total capacitance is additive:

$$C \text{ (total)} = C_1 + C_2$$

However, when capacitors are combined in series, the formula for total capacitance is:

$$C \text{ (total)} = \frac{C_1 \times C_2}{C_1 + C_2}$$

While a test lamp can be used in checking capacitors, such a test requires that the serviceman have "calibrated eyeballs," Asproth said.

## You Asked About It

From the many requests for information it receives, the NEWS will select and publish some of general interest. In many instances, the answers will be supplied by authorities in the industry.

Two questions and a comment on Paul Reed's recent articles on leak testing.

Concerning the use of carbon dioxide to build up pressures in leak testing, J. E. Watkins, Maywood, Ill., advises against the use of CO<sub>2</sub> in ammonia plants "under any conditions."

"It is just too easy to assume that the moisture has been removed—not a simple procedure where free water may be trapped in shells or lines," Watkins warns. "Too often new systems develop sticky solenoids, compressor oiling troubles, and what not after a short period of operation. In those cases where CO<sub>2</sub> was used for testing, a hard, white substance is found to have coated critical

surfaces throughout the system.

"The substance is ammonium carbonate—formed by the reaction of ammonia, carbon dioxide, and water. Correction may require several complete changes of ammonia," he says, "and the leak testing method which caused the difficulty just isn't that good—or that necessary."

**Q. I am having trouble finding small leaks in household refrigerators. Would it be advisable to use the oxygen from the oxy-acetylene torch to increase the pressure?**

**C. J. R.—Moorefield, Ky.**

**A. No.**

Basically, it is unsafe to pass free oxygen through a system because the gas may react with any oil or grease present and

cause fire. Open flames in a kitchen would add to fire danger.

The recommendation of one major domestic refrigerator manufacturer is to put in 6 oz. of the same refrigerant with which the unit is normally charged. At room temperature, this is normally enough pressure for leak detection.

If more pressure is needed, dry nitrogen should be used. In increasing the pressure, however, care must be taken not to exceed test pressure limitations set by the manufacturers. These test pressures are given for both high side and low side; in a capillary system, of course, the maximum pressure allowable is that for low side.

The second question on leak testing actually questions the basic mechanism of adding a second gas to increase pressure. Since the answer will be lengthy the question and answer will appear in the next column.

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# A Look at Future Factory Comfort Conditioning (2)

## Sees More Concern with 'Acceptable' Humidity at Lower Cost and Tonnage

By B. D. Henderson, Vice President,  
Westinghouse Electric Corp., Staunton, Va.

I suppose that all I have said so far is merely repetition of facts most of us have known all our lives. It is hard to work when it is hot! You don't feel good—you become lazy—and you are apt to be irritable.

Air conditioning at a place of work can be a wonderful thing, but air conditioning costs money. Others have aptly proven and documented that it takes only a slight increase in production to pay for the cost of air conditioning.

If you wish more documentation on this subject I refer you to John Haines, vice president

of Minneapolis-Honeywell, who has conducted some extensive research and is prepared to show you that a very minor increase in output can quickly pay for air conditioning a factory. (These findings were published in detail in the Nov. 18 and Dec. 9, 1957 issues of the NEWS.)

For my part, I would like to hazard a guess that the cost is much less than many of you have assumed.

A few years ago our Radio & Television Div. at Metuchen, N. J., called us for some immediate assistance in air condi-

tioning their plant. Although they have only a few days a year at Metuchen which are as hot and humid as those which are common here in Houston they were still experiencing enough difficulty to cause them to shut the plant down early and send people home because of the heat.

Although work could have been continued, the heat made it impossible to expect the employees to maintain the rate of activity which could normally be sustained without any great effort. Besides, they were most uncomfortable!

An engineering study showed that this particular 175,000-sq. ft. area would need 540 tons for partial air conditioning, or about 3 tons per 1,000 sq. ft. Installation of a central system would have taken the rest of the summer. It so happened we had available for immediate delivery nine 30-ton packaged air conditioners, totaling only 270 tons of capacity, or exactly half the amount which appeared necessary.

However these units could be installed at once since they required nothing more than to set them down on the floor—hook them up to water and power—and let them run. These nine units provided all of the air conditioning they have ever needed. Under the worst conditions they have not only been able to maintain a temperature differential of 12 to 14° below outside air, but they have brought the humidity under control, which is the greatest boon of all. 1958 will be the third summer they have been in use. Most of this plant's nearly 3,000 people work in this air conditioned place.

### Low Cost Cooling

To give you some idea of the cost of air conditioning such a plant let me say that this Metuchen installation could be duplicated at present day costs for approximately 25 cents per square foot of conditioned space installed.

Yes, I said 25 cents. The Metuchen installation actually cost considerably less than that.

I wish to point out that this was a partial air conditioning job. But even as a partial air conditioning job most of the primary benefits were achieved. And there is no problem in full completion at any time at very low cost.

The first and biggest benefit

achieved was the improvement in humidity. This in itself brought a great deal of relief from the heat. By closing the plant up and keeping it closed night and day this air conditioning used the thermal storage capacity of the building and made it possible to work against the average temperature rather than against maximum temperature at the heat of the day.

### Pre-Cooled at Night

By operating the equipment at night as well as in the daytime the plant is pre-cooled. This, too, tends to reduce the tonnage of equipment required. The use of large packaged self-contained units made it possible to:

1) Use much less air conditioning than originally calculated without prejudice to the ability to add later if needed.

2) Make the installation quickly with stock materials without the need of extensive fabrication of ductwork or an air distribution system.

3) Obtain a much lower cost, all things included, than would otherwise have been possible.

In many cases the existence of industrial processes generating heat make air conditioning an entire factory area impossible. In those cases two approaches are used: The incoming air supply is passed through air conditioners and dehumidified while the exhaust air of the building is taken out over the hot area. This is satisfactory in many plants.

This article, the second of two parts, is the text of a talk on "Air Conditioning in Industry" by Bruce D. Henderson, vice president, Westinghouse Electric Corp., Staunton, Va. The talk was presented before the Houston Industrial Forum sponsored by Houston Power & Light Co. It covers all the bases.

### Recovery Areas

In process plants, where there is a great deal of heat involved in processes, it is becoming more and more common to use recovery areas.

For example, one Pittsburgh steel company has found that the use of low humidity, moderate temperature areas for men to stand or rest between heats, makes it possible for a man to work on open hearths and other steel mill equipment with little loss of efficiency through the hottest weather.

If a person spends 10 to 20 minutes in such a recovery area his blood pressure, pulse, and ability to do his work will return almost to normal, and he can re-enter a hot area and work at high speeds and full efficiency for another stretch of some duration while a furnace is being charged, tapped, or heat is being poured.

On the other hand, if this recovery area is not available, after one such work stretch, he will continue to have reduced effectiveness, coordination, and greatly increased fatigue. Again, large packaged air con-

(Concluded on next page)

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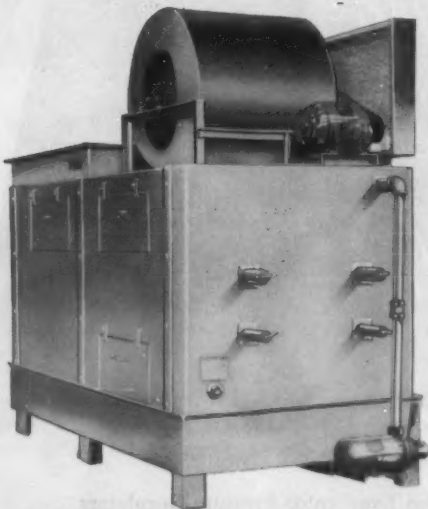
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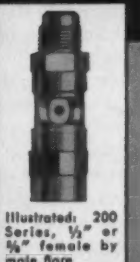
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FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES



## Future Factory Cooling--

(Concluded from preceding page) conditioners requiring only electricity and cooling water make such spot cooling quite simple to provide.

In many industrial operations, particularly in process industries, the normal amount of water consumed is sufficient to supply the required cooling water without towers or other cooling apparatus by routing the process water through the air conditioning before using it otherwise. We do that at our own air conditioning manufacturing plant in Staunton, Va. I admit that at times early in the morning water out of the cold water faucet steams a little.

Many people have expressed a great deal of interest in the future of the heat pump for heating and air conditioning, not only in residences but in factories. The use of the heat pump for the residence or small commercial establishment is an accomplished fact. At certain seasons of the year more than half the output of our Staunton Air Conditioning Div. is in heat pumps.

### Sees Big Heat Pump, Resistance Heat Future

I am on record with the prediction that within 10 years more heat pumps and resistance heating will be installed each year than all other systems of residential and small commercial heating combined. The reasons for this are not hard to find.

Electric power costs have been going down year by year for as far back as you can remember, compared to other forms of delivered energy. And the end is not in sight! Natural gas or oil, which are its only surviving competitors for heating, are so valuable as chemicals and premium fuels for transportation, it is almost certain that they will become more and more expensive compared to electric power. And, as everyone in Houston knows, oil is an extremely valuable natural resource with which nature has endowed us, and which is becoming more and more difficult to find, and more expensive to produce.

All of these same considerations apply for industrial heat pumps and industrial heating. As a matter of fact there is one other important additional possibility for the industrial heat pump. Most industrial power is supplied on a low energy rate with a substantial demand charge. Generally speaking the greatest consumption of electric power by the heat pump would occur during periods when the least amount of energy was being consumed by the industrial process—the characteristic off-daily peak power required.

However, there is a real problem in connection with the industrial heat pump. Each one must be a very highly engineered job, carefully tailored to the specific case in hand. The source of heat will usually be water in some form rather than air which is customary in the small packaged residential type heat pump. This water needs to be, generally speaking, at 50° or above to minimize the danger of freezing when the heat pump chills it even further in extracting its heat supply. By its nature the industrial heat pump is usually a central heating and cooling system which requires quite careful engineering.

There is nothing new in the way of technology involved in a straight heating application of a heat pump. It is no different from a refrigeration or air conditioning installation employ-

ing the same size equipment.

The only difference is whether the useful work is considered to be the removing of heat from a place that is cold, or whether you are interested in the other end of the machine where heat is added to a place that is warm. Complications with the heat pump occur when you attempt to reverse the equipment and make the cold end hot and the hot end cold.

This means evaporators, condensers, and piping must perform dual functions. Lines must be designed to carry first liquids and then gases and still produce the proper carry-through of the lubricating oil in the system. Control systems must be designed to convert evaporators into condensers, and condensers into evaporators without producing slugs of liquid refrigerant, or trapping the lubricating oil, which would wreck the compressors.

These problems are generally

not difficult during continuous operation. But they can be quite difficult during the transition which occurs when the unit is changed from heating to cooling or vice versa; or during a defrost cycle, or under certain conditions of start up.

### 'Industrial Heat Pump To Be Common'

The heat pump for industrial application is not only feasible but will eventually be quite common. In the meantime I caution you to make sure that a consulting engineer, responsible for design of the system, is thoroughly conversant with the peculiarities involved with heat pump design and application. Most of these problems have been eliminated in the packaged units made in factories where the relationship of all the components can be carefully established in advance.

I would like to summarize. Industrial comfort air condition-

ing can substantially reduce the frequency of accidents—the frequency of errors and mistakes—the frequency of grievances and industrial disruptions. It can produce conditions which are conducive to year-round improvement in productivity, pace, and effort—and it can make possible the hiring of the most desirable employees—other things being equal.

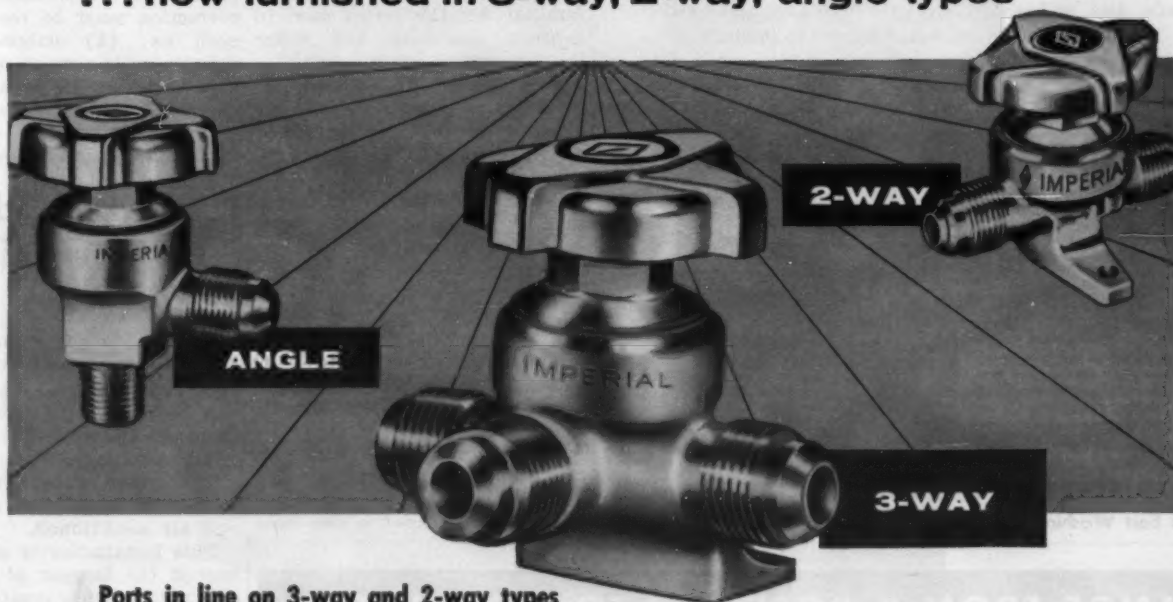
The present trend is for partial air conditioning of factories with sufficient cooling equipment to lower the humidity and partially lower the temperature to levels which are common in commercial and residential applications.

Large factory packaged self-contained units are becoming more and more prevalent because of the ease and speed of installation and the ability to install the minimum air conditioning initially and increase to the optimum as needed at a later date.

## More compact installations with

# IMPERIAL DIAMOND VALVES

... now furnished in 3-way, 2-way, angle types



Ports in line on 3-way and 2-way types  
No need to make offset bends  
Flare and solder connections  
2/3 the size of ordinary valves

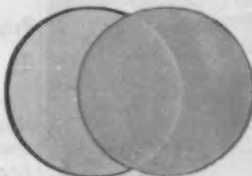
Greater compactness... ease of operation... reliability... economy—features that have made Imperial Diamond Valves so popular—are now available in 3-way, 2-way and angle types for 1/4 to 3/8" O.D. tube. Furnished with either flare or solder connections.

Solid Teflon diaphragm protected on top with high tensile strength Du Pont Mylar disc. Provides extra durability and heat resistance. Prevents damage due to over-torquing.

These valves eliminate need for offset bends, with 3-way and 2-way types, since connections are in one plane.

Order from your Wholesaler or write for Bulletin 119-REF.

### MYLAR PROTECTED TEFLON DIAPHRAGM!



High tensile strength Du Pont Mylar disc (23,000 psi) protects top of diaphragm, prevents damage from over-torquing.

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Copper tube extensions dissipate heat when soldering... no need to disassemble valve.

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**Ventilating Duct Systems**

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## Air Distribution Requirements In Year-Round Air Conditioning

### Part 2—Fundamentals of Air Handling

By Frank D. Klein, Chief Engineer, Governair Corp.

Because of fan relationship to ducts in forced air systems, further fundamentals must be understood that relate to their application in both equipment and system design.

Fans are laboratory tested and rated by their manufacturers under a precise set of circumstances and conditions. Though the design concept

varies between manufacturer, the ultimate performance aim is the same. Furthermore there exists a standard nomenclature as well as mathematical expression of progressive relationships, specific to this ultimate group of performance factors. It is these that we as engineers should know and understand.

The word Pressure is used for

a lot of expressional definitions. It is used also in defining fan performance; in fact used as, Static Pressures, Velocity Pressures, Total Pressures, etc. When used in defining fan performance they explain characteristics as follows:

**A. FAN TOTAL PRESSURE:** The Total Pressure of a Fan is the rise of pressure from fan Inlet to fan Outlet when corrected for friction.

**B. FAN VELOCITY PRESSURE:** The Velocity Pressure of a Fan is the pressure corresponding to the average velocity determination from the volume of air flow at the fan outlet. This is calculated on area of discharge.

**C. FAN STATIC PRESSURE:** The Static Pressure of a Fan is the Total Pressure minus the fan Velocity Pressure.

Mathematically in formulae the foregoing are expressed as:

The Total Pressure =  $P_t$

The Velocity Pressure =  $P_v$

The Static Pressure =  $P_s$

Some of the other nomenclature with which we should be familiar are the terms used to express operating and other characteristics quantitatively.

**Standard Air Unit Density** is normally used for corrected air density (see previous text) and when so used is equivalent to .075 lbs. per cu. ft.

**Standard Unit Of Pressure** is used to define the inch of water column of density of 62.3 lbs. per cu. ft.

**Fan Volumetric Capacity** is a most familiar term and is expressed in Cubic Feet Per Minute. (c.f.m.) expelled or available at the fan outlet, as a result of the fan's performance, in volume.

**Fan Power Output Factor** is the Horsepower based on fan volume and fan total pressure.

**Fan Power Input** is the mea-

sured Horsepower delivered to the fan shaft.

**Fan Mechanical Efficiency Factor** is the direct ratio of horsepower input to output.

**Fan Static Efficiency** is the mechanical efficiency multiplied by the ratio of the static pressure, that is (1) Total Mechanical or  $e_s = \frac{P_s}{P_t}$  Thus:

shp (shaft hp.)

(2) Static or  $e_s = \frac{P_s}{P_t}$  Thus:

**Fan Outlet Area** is the inside area of the Fan outlet.

This is not to be confused with the Fan Duct connection Outlet area.

**Fan Inlet Area** is the area of the Inside of the inlet collar at that point adjacent to the impeller or periphery of the wheel.

**Correction To Constant Speed For Fan Operational Variables**, means simply this. Because all Total Pressure, Velocity Pressure, Volume, and Power Input must be corrected to some standard constant before comparison is made, mathematical correction must be resorted to, such as: (1) volume varies directly as the speed, (2) pressure varies as the square of the speed, (3) power varies as the cube of the speed.

(To Be Continued)

### Army Aviation School Gets 450 Tons of Air Conditioning

DOTHAN, Ala. — More than 450 tons of Worthington packaged air conditioning equipment has been installed in 35 classrooms at the Fort Rucker, Ala. Army Aviation School.

The entire Fixed Wing and Rotary Wing ground school is now air conditioned.

This installation is said to be one of the largest of its kind and will provide comfort cooling for base personnel being schooled in the flight instruction and maintenance of Army aircraft.

The packaged units, consisting mainly of 10-ton sizes, have been installed remotely as well as in the space to be conditioned.

The air conditioning equipment was installed by Smith's, Inc., Dothan, Ala.

The consulting engineer was De Laurel & Moses of New Orleans.

### Promotion Kit Designed To Promote Humidifiers

NOVI, Mich. — A new promotion kit designed to help contractors increase their humidifier sales is now available, according to Robert Gregory, vice president, General Filters, Inc. here.

The kit consists of two sizes of ad mats, instructions on making a mailing to a prospect list, and a study of the humidifier market.

It may be obtained without charge by writing the company.

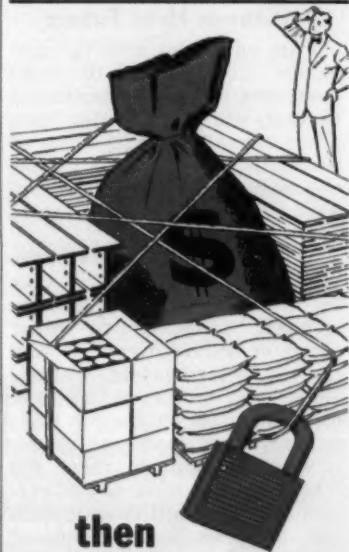
### Southern Calif. RACCA, IHACI Hold Joint Meeting In Los Angeles May 13

LOS ANGELES — A joint meeting of the Institute of Heating & Air Conditioning Industries and Refrigeration & Air Conditioning Contractors Association of Southern California will be held at Rodger Young auditorium Tuesday evening, May 13, the group recently announced.

"Contractor working capital, financing, and bank relations" is the subject of the speaker, N. C. Luhmann of San Francisco, vice president of First Western Bank.

The joint meeting will be presided over by Don Kissell, president of RACCA of Southern California, and Kenneth N. Robertson, president of the IHACI, the announcement stated.

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from there.

Meier Electric & Machine Company, Inc. offers you over 50 years of experience, plus the scientific and technical know-how and equipment necessary to provide you with the correct propeller for your product. With this background of experience — coupled with continuous scientific research, modern production and technical facilities — we're in a wonderful position to serve both large and small manufacturers of products involving air movement. Try MEIER.



Let MEIER's direct factory representative tell you about the many thousands of possible combinations from these standard components.

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### CHANGE FROM 2-POSITION TO 3-POSITION

(or vice versa) ... IN 30 SECONDS ...

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Standard Duty Selector Switch!



Here's a single switch—the standard duty Bulletin 800—that is good for either 2- or 3-position operation. Simply loosen two screws, rotate the metal plate through 90°, retighten the screws... and that's all. The action of the operating lever is "positive." Maintenance free, double break, silver alloy contacts are protected within the cover—careless wiring cannot cause trouble. Write for catalog.

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So. Calif. RACCA

## Bowe To Coordinate Joint Mechanics Training, Outlines Program Objectives

LOS ANGELES—Harry L. Bowe has been appointed full-time association coordinator to work with the Joint Journeyman & Apprentice Training Committee of Refrigeration & Air Conditioning Contractors Association of Southern California on the certified journeyman program which starts in September.

Bowe stated to a meeting of RACCA members that he considers it is important for the program to:

"Clearly establish objectives of journeyman training.

"Obtain and maintain acceptance of the program.

"Provide ways and means for facilities, materials, and measuring devices.

"Make every effort by every legitimate means to get full recognition of the industry as an adult industry.

"Help establish policies of operation and certifying which are clear and workable. One thousand journeymen and over 100 apprentices are affected.

"Consider material for carrying on the training program. This is the most pressing and also the most complex item to be settled.

"Select the right instructors. This is of utmost importance since more and more of the work the journeyman does was, just a few years back, the responsibility of the engineer.

"Maintain continuous joint effort of management and labor to make the program successful."

Bowe has arranged to take a leave of absence from his full-time position with Los Angeles city schools. His new job is to develop the RACCA training courses, make recommendations for classroom arrangements, fixtures, teaching aids, and have everything in readiness by September for the start of classes which are to prepare journeymen for certification.

Certification will yield an additional 25 cents more per hour.

Bowe has been with the refrigeration and air conditioning industry 30 years. Beginning in 1941 he served as joint apprenticeship committeeman and instructor. He was at one time

president of U. A. Local 508.

His work as refrigeration journeyman continued until 1947 when he became full-time coordinator of piping trades for the school system where he supervises plumbing, refrigeration, and pipefitting training, with 32 instructors in adult education, trade extension including apprentice classes, and night school.

He qualified in 1950 for his state teachers and coordinators credential after taking academic courses during all three summer sessions every year for three years at University of California Los Angeles, and by taking university extension courses.

## Distributor Has Exhibit On Cooling Advancement

PHILADELPHIA — M & E Refrigeration Accessories Co. held its annual exhibit at 2035 Washington Ave. recently on "Advancement in Refrigeration and Air Conditioning."

Manufacturer personnel displayed their firm's products and were on hand for technical discussion during the four-hour evening show.

Companies represented included Ansul Chemical Co.; Bohn Aluminum & Brass Corp.; Calgon, Inc.; Detroit Controls, Div. of American-Standard; Dean Products, Inc.; E. I. du Pont de Nemours & Co., Inc.; General Controls Co.; Halstead & Mitchell; Jarow Products, Inc. and Madden Brass Products Co.; Kenmore Machine Products, Inc.

Also, Merchant & Evans Co.; McQuay, Inc.; Mueller Brass

Co.; Penn Controls, Inc.; Ranco Inc.; Revere Copper & Brass, Inc.; Reynolds Metals Co.; Tecumseh Products Co.; Temp-rite Products Corp.; and Virginia Smelting Co.

## Childers To Assist Knoff In New Airtemp Sales Post

DAYTON—Naming of George H. Childers to the new post of special assistant to the vice president in charge of sales has been announced by Airtemp Div., Chrysler Corp.

Childers formerly headed the national sales organization of the Mathes Co., Fort Worth, Texas air conditioning manufacturing firm. He resigned the post recently.

His headquarters will be the Airtemp plant here. As aide to J. F. Knoff, sales vice president, he will be particularly associated with the company's market analysis program.

## McCarthy Is Remco Sales Representative

ZELIENOPLE, Pa.—Charles G. McCarthy has been appointed sales representative for Remco, Inc., manufacturer of filter-driers, liquid indicators, and other items for refrigeration and air conditioning, it was announced by Ken Newcum, vice president.

McCarthy, with offices at 15864 Snowden Ave., Detroit, will call on automotive accounts, original equipment manufacturers, and wholesalers throughout eastern Michigan, Ohio, and western Pennsylvania.

## Louis Putze Elected

CHICAGO — Louis Putze, president of Controls Co. of America, was elected a director of the national Young Presidents' Organization at the annual meeting in Honolulu, T. H.

SO HALSTEAD & MITCHELL ENGINEERS SAID:

# When Gross Profits Depend on Refrigeration...



PROTECT THOSE PROFITS WITH  
HALSTEAD & MITCHELL CLEANABLE  
WATER-COOLED CONDENSERS

Over 50% of the gross profit of the average supermarket comes from refrigerated items. Naturally, the refrigeration system has to be dependable . . . which is why so many supermarkets specify Halstead & Mitchell Cleanable Water-Cooled Condensers. In fact, all types of stores relying on refrigeration units are insisting more and more on H & M Condensers. Here's why:

H & M Water-Cooled Condensers operate quietly, and give full capacity even on the hottest days or in crowded equipment rooms. Condenser headers can be removed easily for quick, thorough, mechanical cleaning of the water tubes. Scale and sludge, which reduce heat transfer, are removed without harmful chemical cleaners. Operating costs stay lower.

No matter what brand compressors you use, insist on H & M's Cleanable Water-Cooled Condensers.

There's a matching Halstead & Mitchell Cooling Tower for all refrigeration and air conditioning applications: sturdy, weatherized, propeller fan models for outside installations; quiet, centrifugal fan models for indoor installations with long duct runs. Take-apart models are available for problem installations.

Ask for all Halstead & Mitchell products at your nearby distributor's or write for descriptive literature—Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.



WATER-COOLED CONDENSERS • COOLING TOWERS  
AIR-COOLED CONDENSERS • FINNED-SURFACE COILS

## FTC Holds New Evis Complaint Hearing

WASHINGTON, D. C.—Another hearing on formal complaint of the Federal Trade Commission against Evis Mfg. Co., San Francisco, was recently held in Charlottesville, Va. by Abner E. Lipscomb, hearing examiner. Evis has been charged with misrepresentation of its water conditioner.

Looking for  
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Check the  
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in the classified  
advertising columns.

# Hot Refrigerant-12 To Keep Officials, Press Warm at Olympic Ice Rink

## Direct Heat Pump Use Keyed To Control System

By Dan Vandament, Vandament & Darmsted, San Francisco,  
Consulting Mechanical Engineers

Hot Refrigerant-12 plays a new role in the Squaw Valley locale of the 1960 Olympic Winter Games for which the United States is host.

A direct heat pump application will keep the press, important visitors, and Olympic officials warm while they watch competition on the main arena ice rink.

It will also yield 50° to 60° F. warmth for the spectators seats on three sides of the big rink, which has a roof but is open on one end to the great outdoors at an elevation of 6,200 ft. in California's high Sierras near Lake Tahoe.

Hot R-12 is used to heat just as if it were steam.

Key to the functions of this plant will be found in the system of Minneapolis-Honeywell controls.

### USES COLORGRAPHIC CONTROL PANEL

A colorgraphic control panel is used. This graphically shows the condition and the functioning of all of the elements in the system.

A 48-point indicating potentiometer is used to sense the temperatures of the ice on the rinks, the brine in the piping at various points, the air from the coils, and from miscellaneous other points.

Ed Long of the industrial department of Minneapolis-Honeywell Regulator Co.'s San Francisco branch office has contributed to the control systems in the over-all concept.

Part of the control system will be developed in connection with York Corp. equipment. York got the bid on equipment, and Warren B. Ludwig, field executive, worked on equipment specifications which are now in the hands of the York factory.

Basic major items of equipment are a 1,000-hp. brine cooler made up of a 3-stage centrifugal compressor, and a separate chiller.

### BRINE COOLER USED ON HUGE RINK

This basic equipment is used to provide the entire refrigeration for about 120,000 sq. ft. of ice rink surface.

In conjunction with that equipment we use a 200-hp. York booster compressor so that we can use air as a heat pump source under low temperature conditions.

Then we have six major "hot gas to air" heating coils of York special design in the heating

and ventilating systems. Basically these are steam coils which use a different heat transfer coefficient in order to meet requirements.

Instead of using steam on the inside we use hot Refrigerant-12 transfer to air at 100° F. outside air leaving coil temperature.

There is a glycol heater of special design for use in melting snow around the walks and for defrosting around the brine tank.

A domestic hot water heater, also using hot gas, is used to heat the domestic water from a

Dan Vandament is a consulting engineer who knows the winter weather of the Sierras, has done mechanical engineering at mines and other operations in the high country of California's "mother lode."

Refrigerant-12 has an interesting role in Vandament's design of an ultra-modern plant for the 1960 Olympic Winter Games in Squaw Valley, Calif.

cold condition to approximately 100° F.

One other basic item of equipment is the outside air heat source evaporator and condenser of special York design, made to perform both functions, alternately of course, because when we do not have enough refrigeration load we use this unit to provide an artificial load.

All this equipment will be in the equipment room, except for the outside air heat evaporator

and condenser which is mounted outside the building on grade.

### OPERATIONS

These are the operations to be performed with this system:

1. Refrigeration for the main arena rink of 17,000 sq. ft.
2. Refrigeration of the speed skating rink or track which is 600 meters and has an ice surface of 48,000 sq. ft.
3. Refrigeration of the practice speed skating rink or track,

which is inside of and adjacent to the main Olympic speed skating event rink or track surface. The practice rink or track has an ice surface of approximately 20,000 sq. ft.

4. Refrigeration for two ice rinks, each 17,000 sq. ft. one on each side of the main rink. One of these rinks is used for Olympic hockey.

5. Melting snow from the roof of the arena. This is a Robinson Q-deck. We blow hot air through the cells in the decking and melts the under side of the snow and causes it to slide off the roof.

6. Reduction of condensation on the steel truss and members supporting the Robinson Q-deck. This is accomplished in the same fashion as the snow melting.

(Concluded on next page)

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GOODS ON THE JOB? THEN READ THE RIGHT HAND PAGE



### DESIGN ENGINEER

Leading multi-plant industrial equipment manufacturer with Mid-Western General Offices seeks the services of a highly qualified engineer thoroughly experienced in the design of air-conditioning and refrigeration equipment and systems.

Minimum requirements: Engineering Degree, 12 years experience and thorough knowledge of the field. Salary commensurate with proven ability. Company paid benefits include hospitalization, life insurance, retirement and profit sharing.

Submit complete resume in confidence to BOX A6021, Air Conditioning & Refrigeration News, 480 West Fort St., Detroit 26, Michigan.



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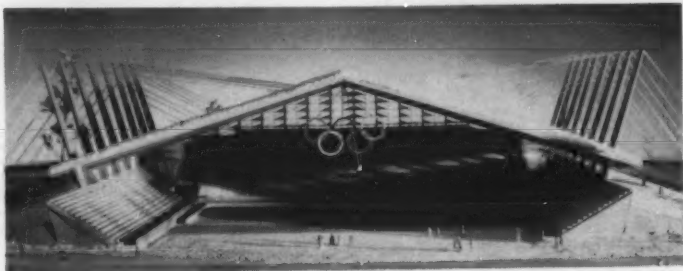
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MODEL of 120,000-sq. ft. Squaw Valley, Calif. ice rink for winter Olympic Games.

(Concluded from preceding page) tank defrost the soil and fill. This is intended to prevent heaving and dislocation of structural members and supports. The brine storage tank extends below the water table in this area.

7. Melting of the snow after it has slid off the roof. This snow falls into an asphalt trench under the eaves of the building. We provide ethylene glycol heating coils in the asphalt of this trench and slowly melt this snow so it can run off.

8. Ethylene glycol heating coils all around the brine storage

9. Air heating in the gravel fill beneath the main arena rink prevents heaving and damage to the rink surface and slab. These air passages are also used to drain the gravel fill.

10. General heating of the lobby, locker rooms, offices, con-

cessionaire areas, toilet rooms, and other miscellaneous occupied spaces located in and under the main grandstand section.

11. Heat is provided for the special television, press, and radio areas located above the grandstand, and for the seating area to be used for press, vip's, and Olympic officials.

12. Provide heating for domestic hot water to be used in shower rooms and toilet rooms. For this we heat the water to approximately 100° by the use of the hot Refrigerant-12 gas, then boost it to 130° by direct electric heat.

The big speed skating track is similar to the shape of cinder tracks used for running races. In the track are 102 pipes which completely circle the rink.

These pipes are 1 1/4 in. thin wall steel tube of .065 wall thickness. This is standard thin wall pipe and was selected for

cost and for its very good conductivity. Across the track these pipes are laid three to a foot.

The practice speed skating rink adjacent will have about 45 pipes across, laid three to a foot.

The covered rink, which will be maintained as a permanent all-year rink, has 1 1/2-in. steel pipe of standard weight, 3 1/2 in. apart on centers.

#### HOT REFRIGERANT HANDLED LIKE STEAM

In the heating units, the hot refrigerant gas is handled essentially similar to steam, piping the hot gas to the coils and condensing the gas in these coils and using the return in a way which is similar to a condensate return system for steam.

The big rink is the largest building in the complete winter-sports center, has 11,000 seats,

and will provide the setting for opening and closing ceremonies of the Olympic Winter Games. Enclosed on three sides, it has an open fourth side facing south.

On this fourth side the seating is movable, arranged parallel to the rink for skating events, but lined up with the permanent seating at the ends of the rink for major ceremonies.

For the complete Olympic Winter-sports center the legislature of the state of California has appropriated \$8 million, and Congress is expected to furnish \$3.9 million more, of which half a million is from the Department of Defense which will conduct Alpine training of troops in the area.

Under development is a program which would have the U. S. National Park Service and the California Recreation and Parks Commission maintain Squaw Valley as a permanent year-round sports center.

This plan would retain the covered rink, and the large speed skating rink.

Members of the Olympic Winter Games commission have recently returned from a tour of European winter sports areas. They say the Squaw Valley plant will be the first such complete center and will be larger than two others now under construction in Europe.

Olympic organizing committee chairman Prentiss Cobb Hale, Jr., of San Francisco, has announced new dates for the games: Feb. 19 to March 1, 1960.

Hale says the Squaw Valley 600 meter speed skating rink or track will be the "largest expanse of artificial frozen ice ever refrigerated for skating competition."

### Fraser & Johnston In Full Production Following Fire

SAN FRANCISCO—Fraser & Johnston Co.'s furnace plant here is back in full production following a fire which broke out in the parts stock room of the plant and caused damage estimated at \$300,000.

The swing shift had left for home when the blaze was discovered at 1:15 a.m. Cause of the fire has not been determined.

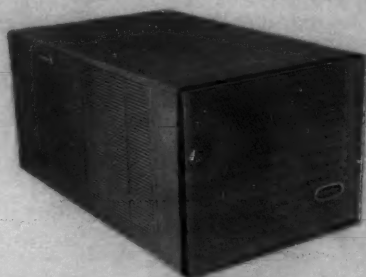
Main electrical power distributing system was destroyed. Temporary lines permitted resumption of production at about 60% of normal capacity for a week, after which full production was resumed.

There was some damage to the testing laboratory. Production machines destroyed included an automatic seam welder and several spot welders. Water damage was considerable.

Irv Fairbanks, sales manager, said damage to the furnace plant building is approximately \$100,000. Damage to motors, controls, other parts, and production machines, is estimated at \$200,000.

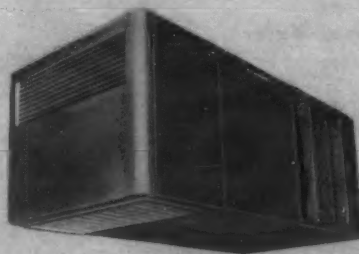
#### For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich. Only 25¢ each.



#### AMAZING NEW AUTOMATIC HEAT PUMP

Two, three and five ton sizes. The three and five ton unit have two compressors, two stage control. Heats and cools without fumes, fire fuel or water! Compact, easy to install, completely self-contained. Most promising and profitable unit you ever sold.



#### TAS COOLING UNIT

Two, three and five ton units. Easy installation; no mess can be done in a few hours. Minimum space needs, goes in attic, basement, anywhere! Power Reserve assures best performance, long life, lasting profits!

## YOU KNOW YOU CAN COUNT ON TYPHOON!

Typhoon adds to your reputation by turning in the kind of performance your clients demand... and more! Each and every Typhoon unit is designed and built to stand up to extreme weather conditions and sudden severe temperature changes without strain or breakdown. Typhoon quality begins with Power Reserve—superior components and oversize parts to deliver beyond rated capacity. All copper condensers in water cooled units, largest coil surfaces, and rugged 11 and 14 gauge metal in durable lifetime cabinets. And Typhoon dependability is enhanced by the flexibility of large and small units that can be easily adapted, split or combined to fit any and all installations with maximum ease and economy. Air cooled units from 2 tons to 20 tons, both packaged and as split systems. Water cooled units from 3 tons to 60 tons. Packaged water chillers, 2 tons to 50 tons. Air cooled condensing units to 20 tons, water cooled to 60 tons. For quality, performance, versatility... next time select Typhoon, the industry's most complete line of packaged air conditioners.

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DIVISION OF HUPP CORPORATION

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Please send me full product information on the Typhoon line.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



# Combine Central, Packaged Systems To Air Condition Courts Building

Uses Existing Duct Risers, Double-Deflection Grilles, Holds Cost to \$300,000

ST. LOUIS—By proper design and ingenious use of existing ductwork, planned air conditioning for nine court rooms and adjoining offices in the Municipal Courts building here was extended to cool the remainder of the three court room floors without increasing the original \$300,000 estimated cost.

The system, a combination of central and packaged units, was worked out by A. L. Munson & Associates, consulting design engineer, and installed by Reliable Heating Co.

## Uses 29 Packaged Units, One Chiller

In summer, cool, filtered air is circulated through the three floors by 29 packaged General Electric air conditioning units and one 200-hp. York centrifugal system.

The York system supplying five Kennard air handling units, cools the nine court rooms, and the packaged units, carefully arranged around the perimeter, cool all offices, judges' chambers, and jury rooms.

Two additional units cool health department laboratories on the ground floor.

The city decided to air condition the courtrooms and adjoining offices to speed up justice and reduce delays by enabling the courts to work during the summer. Three hundred thousand dollars of bond issue funds were allotted to the project.

Munson's firm was called in to make a preliminary estimate by Joseph P. Sestric, director of public safety for the city.

A thorough preliminary survey of the cooling needs of the building revealed that a combination of a central system for the court rooms, and packaged units for the balance of the building would serve the best interests of everyone concerned, and would be the most economical to purchase and operate, Munson said.

## Ducts Found To Be Adequate

He continued: "The system would make use of existing duct

risers to each court room as the ducts were found to be of adequate size.

"This would permit the complete conditioning of the courtrooms without defacing them with ductwork, or cluttering them up with space-taking packaged units. In addition it would help to keep the sound level of cooling or heating equipment to a very minimum.

"Space was found in the existing basement for the central system required for the nine courtrooms, so no new expensive building was needed.

"Sestric and the late Frank J. McDevitt, who was then president of the board of public service, were pleased with our report. They gave us a contract to complete the design and to prepare plans and specifications. (Frank Kriz is now president.)

"The more we got into the thing, the surer we were that our preliminary thinking was correct.

"Essentially the center rooms of the four-story building are the court rooms. The perimeter of the building consists of offices, judges chambers, jury rooms, etc. As in many public buildings, there is some wasted space, due to light courts, etc. The building has a basement which is accessible only via one of the two small prisoner elevators.

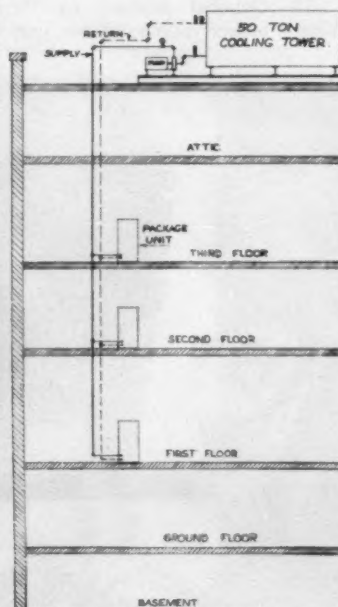
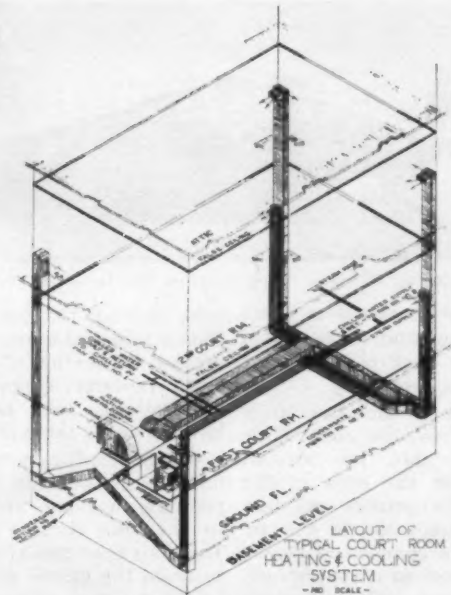
## Pipe Shafts Used For Condenser Water

"In each corner of the building an existing pipe shaft was found that would be suitable for condenser water pipe between cooling towers and the packaged units. It was therefore logical to locate four 50-ton cooling towers on the roof as close to these pipe shafts as possible, since much less piping was involved.

"The packaged units were grouped as close to these pipe shafts as possible, and as the arrangement of the rooms on each floor permitted.

## Cooling Tower Centered on Roof

"A 200-ton cooling tower was located nearer the center of the



SCHEMATIC drawing showing cooling tower located near center of roof, almost directly above the 200-hp. centrifugal water chiller in the basement.

roof where it would be almost directly above the 200-hp. centrifugal water chiller in the basement. The 5-in. condenser water piping for the central system was brought down in one of the light courts.

"Four 2-zone units and one single-zone unit provide the conditioned air for the nine court rooms. The four 2-zone units were located in the basement close to existing duct risers to each courtroom in order to hold

(Concluded on next page)



Tells the Truth about Temperature

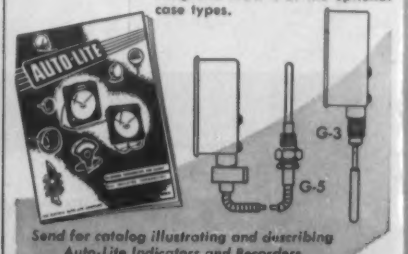
The Auto-Lite Model "G" Temperature Indicator provides low-cost protection against temperature variations in processing and storage operations. This reliable temperature indicator is Auto-Lite engineered for your specific needs... offered in 8 types of cases.

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ATTIC AIR CONDITIONERS  
TRANSOM UNITS  
AIR CONDITIONERS TO 4,000 LBS.  
UNIT HEATERS

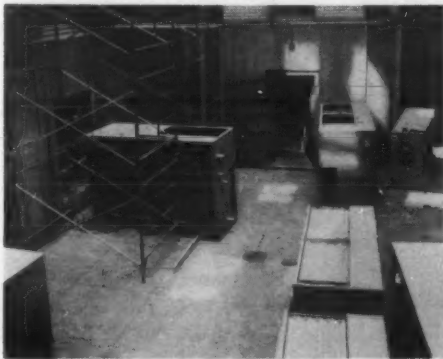
The Hastings HOIST-IT is easily portable. Two men can quickly set up and raise up to 4,000 lbs. to a height of from 8 ft. to 24 ft. This is a valuable and profitable tool for all Air Conditioning and Heating Contractors.

Write For Prices & Bulletin AC-58-H

HASTINGS AIR CONTROL, INC. OMAHA 5, NEBR.







NEW sections of Kennard air units in process of installation.

(Concluded from preceding page) down sheet metal costs and duct losses.

"The single zone unit was located in a corridor next to City Court No. 1, and suspended from the ceiling. This held duct losses to a minimum.

"Pneumatic controls were arranged to provide individual temperature control in each courtroom by the operation of face-and-by-pass dampers. The economizer type of system was employed that permitted 100% fresh air operation whenever the outside air temperatures could do the conditioning job.

"When the job was completed and in operation it was found that some of the judges wanted 80° F. and some 74° F. in their court rooms during the winter months. With the Johnson Service control system provided, they were able to secure what they wanted.

"All the court rooms had been equipped with large unattractive cast iron type of grilles which often needed some kind of sheet metal scoop to direct the air. Now each courtroom has modern double-deflection grilles which can be adjusted easily for proper air through and circulation.

#### Troubles Encountered

"An interesting sidelight was presented by some judges, who either didn't particularly want air conditioned summer sessions, or were unduly disturbed by the noises of installation.

"They caused frequent delays and additional costs due to overtime work. Some of the workers on the job were threatened with jail if they didn't stop making noise.

"During the installation of this equipment two prisoners escaped into the Municipal

Courts building by climbing up a construction ladder from the prisoners' courtyard.

"Another time a gun smuggled in to a prisoner was flourished and fired by that prisoner in a courtroom, endangering many lives including my associate J. W. Minton and some sheet metal workers.

"The prisoner ran from the courtroom emptying his pistol but was shot between the eyes by an alert police officer.

"After that everyone in the building ducked down every time a hammer was used on a sheet metal joint.

"The 5-in. water lines to the 200-ton York centrifugal run down into the prisoner's courtyard and from there into the basement where a 15-hp., 600 g.p.m. Fairbanks Morse non-overloading pump circulates the condenser water.

"The big equipment installed in the basement had to be skidded down through the prisoner's courtyard and then through what had been barred windows into the basement. New hinged barred windows had to be provided for future access and to prevent escapes.

"Chilled water is pumped to the five fan-coil units handling the court rooms. This arrangement permits the best use of the flywheel effect of the large chilled water capacity for sudden loads in one room or another.

#### Steam Coils for Heating

"Steam coils are provided in each fan-coil unit for heating, using City steam that is piped in from a remote power house.

"The chilled water piping required was held to a minimum by the arrangement and location of equipment in the basement. The water chilling equipment is located in the center feeding out like fingers to the five fan-coil units.

"The perimeter of the building is handled by 31 packaged units. Except for one Carrier unit these are all General Electric packaged units. There are seven 10-ton units, 16 7½-ton units, five 5-ton units, one 2-ton unit with remote air-cooled compressor (located on adjoining roof), and two 1½-ton console units. An additional 25-ton cooling tower located in the basement handles the two ground floor laboratory units for Dr. Duffit.

## Commercial Air Conditioning

"These packaged units are arranged into logical zones for good control and are all equipped for outside air operation. The piping work around each unit is concealed behind a neat sheet metal housing.

#### Only Run When Cooling Tower Does

"None of these units can operate unless its cooling tower is in operation. A pressure switch is located at the unit in the water line to the condenser which only closes the starting coil circuit when there is pressure in the line indicating tower operation. This method saved considerable wiring and operates very well.

"Most of the visible ductwork involved was for these packaged units. Wherever possible the return air duct was run directly under the supply air duct, and the entire duct system was

streamlined for appearance.

"All ductwork for packaged units have the appearance of beams or columns, since sheet metal filler pieces were used and all joints were caulked.

"City maintenance personnel under the direction of Walter P. Malloy (who is now the Director of Public Utilities for the City) start the pumps and towers every morning and shut them down at night. They also handle filter changes and oiling and only call in outside help for mechanical failures, or control troubles, etc."

Perimeter baseboard heating and steam coils for all the packaged units—are now being installed throughout the building by the Corrigan Co. who recently secured the contract for completing the modernization of the heating system in the building based on the plans and specifications prepared by A. L. Munson & Assoc.

## the trend is to compact line valves

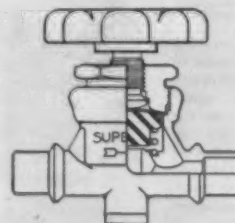


...with the Superior "Tuffy"  
you get easier installation ...  
longer, more satisfactory service ...  
plus reduced original cost

This small-but-mighty line valve has proven to be a faultless performer in large and small refrigeration systems. Tests in our laboratory and in the field indicate that flow capacity is equal to or greater than larger valves now in operation. Pressure drop has been reduced to a minimum. The solid lower stem, made of special nylon, assures long, trouble-free service.

Try "Tuffy" valves—get outstanding performance in any installation requiring vacuums as low as 1 micron.

You can't beat "Tuffy"—better buy 'em.



#### outstanding design features

forged brass body  
special nylon lower stem  
metallic diaphragm construction  
satisfactory for vacuum service  
positive shut-off assured

"Tuffy" valves, pioneered by Superior, are available at leading jobbers everywhere.



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Pittsburgh 26, Pennsylvania

## Will Pay Cash For ROOM - AUTO PACKAGE Units in Original Crates

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#### NEW Acme FLOW-PAC® packaged liquid chillers

Compact, simple to install and operate, these new Flow-Pac chillers are ideal for residential and small commercial cooling requirements. Complete copper liquid circuit makes them perfect for chilling drinking water or process liquids that steel coils can't handle. Available in air or water cooled types from 1¼ to 5 hp.

'Phone or write Acme for details



# For Success In Developing Commercial Refrigeration Service Business—

**Advise: Work Hard, Do Job Right First Time  
Keep Accurate Records, Satisfy People**

By George M. Hanning

CHICAGO—How does a firm starting from scratch develop one of the three largest commercial refrigeration service businesses in a major market like Chicago in less than 10 years?

If Guido Restagno, president of Resco Refrigeration Service Inc., had to give the answer in two words, they would be "hard work."

If given a little leeway, he would add "doing the job right the first time, keeping accurate records so that costs are known at all times, and keeping employees and customers satisfied."

That has been Restagno's formula for rapid success. Back in 1948 he gave up his job as service supervisor for Refrigeration Maintenance Corp.—still one of the largest service organizations in Chicago—to start out on his own servicing refrigeration equipment.

Together with Martin F. Ladd, now vice president of Resco and supervisor of installation, Restagno began selling and servicing General Electric condensing units in 1950. Two years later, he added General Electric packaged air conditioning units.

Working long hours to see

that the job was done right paid off. Resco has grown rapidly and steadily until today the firm does a \$300,000 a year volume in maintenance contracts alone and approximately \$2 million in sales and servicing of refrigeration, air conditioning, and heating equipment.

The company, its sales operation conducted under the name Resco Air Conditioning and

**This is the first part of a two-part article.**

Heating Co., sells no refrigerated fixtures, just condensing units plus air conditioning and heating equipment.

Service, the original source of strength, is still the kingpin. Forty-five of the firm's 125 employees are field servicemen. Twenty-eight men make installations and five work full-time in the shop.

The sales staff has burgeoned to 11 men, supervised for the past four years by Jesse Swartz, sales manager.

## Scours Area for Business

Resco scours the entire metropolitan Chicago area for business. To do this, it divides the service force into two parts. One works out of the firm's

headquarters' on W. 63rd St. on the south side and the other operates from a W. Montrose address on the north side.

The sales force headquarters is in a third building on W. 59th St. not far from the 63rd St. office and shop.

The service department processes some 20,000 service calls a year while the installation crews install some 600 commercial and residential air conditioning units and approximately 400 refrigeration condensing units a year.

All dispatching and record keeping operations for the service and installation department are handled through the south side headquarters.

Dispatching is done by two dispatchers aided by two girls taking incoming service calls. One dispatcher handles 16 servicemen working out of the northside office and the other routes the remaining men about the south and west sides.

## Will Service Any Make of Equipment

With its well-trained personnel, Resco will run service on any make of equipment. Work on equipment it did not sell or does not have under service contract is done on a c.o.d. or charge basis.

While Resco's servicemen are trained to service any type of equipment, some can do certain types of work better than others, Restagno said. It is the dispatcher's job to send the best available man to handle the complaint. Therefore, he must know his men's abilities.

## 'Have Men Do What They Do Best'

"We try to keep the men doing what they are best at," Restagno commented. For this reason there are no specific territories and the men are not assigned to specific installations. They generally operate in a particular area.

To promote efficiency of operation, service paper work is held to a minimum. Only a service order form and a service ticket are used.

When a call comes in, the telephone girl fills out a service order in quadruplicate. The 4½ by 7-in. form includes all pertinent information as to customer's address, telephone number, who to invoice, who authorized the work, make of unit, nature of complaint, whether or not equipment is under contract, how the work is to be paid for, who took the call at what time, when the order was issued and to what serviceman, and the date promised.

First copy of the service order goes into an address file. It is kept for two months as a guide to later customer inquiries about the work.

Second copy for the office file is attached to the serviceman's work order and remains with it until the job is completed.

Third copy is kept by the serviceman. Fourth copy for control is immediately filed for reference. It is removed when



GUIDO RESTAGNO and JESSE SWARTZ, president and sales manager, respectively, of Resco Refrigeration Service, Inc., one of the three largest commercial refrigeration service businesses in Chicago, check over a blueprint.



SOME 20,000 SERVICE CALLS a year are processed in this dispatching center at Resco. James Davis, credit manager (l.) consults John McMahon, dispatcher. John McArdle is other dispatcher. Call takers: Christine Goldsberry, Mary Rose Faubel.

the service ticket is turned in and processed.

The call taker turns the service order over to the dispatcher who assigns work to a serviceman. Serviceman, on completing call, makes out a service ticket which indicates trouble found and work done. He also makes his recommendations concerning the job and

lists materials used. The 8½ by 11-in. service ticket is made out in triplicate. First copy goes to office file, second serves as requisition for parts and materials, and third is given to customer.

And that, says Restagno, is all the paper work involved in the service operation.

(To Be Continued)

## EXCLUSIVE NEW KMP KAP-KIT

...the Complete Capillary  
Replacement Assembly

Plus STRAINER-CAPILLARY  
FAMOUS KENMORE  
MOISTURE MAGNET® DRIER  
...ALL IN ONE UNIT

- NO GUESSWORK...NO CUTTING
- PROPER CAPILLARY FOR UNIT SPECIFIED
- AMPLE CAPACITY MESH STRAINER AT INLET
- PLUS KMP MOISTURE MAGNET

**Now** KMP KAP-KIT gives servicemen a complete, tailored assembly for replacement in the field... the proper size drier for the capillary. KMP KAP-KIT provides precision metering control for all refrigerants and has the drier in the proper location used by all leading manufacturers—The LOW SIDE. When drier is placed in refrigerated position at the end of the capillary, desiccant adsorbs more moisture and, more important, retains the moisture.

Insist on Exclusive KMP KAP-KIT... a strainer assembly, Moisture Magnet of spun copper (in all popular sizes), plus flare nuts and bonnets... uniformly produced at lowest cost.

This assembly can be used with either Freon 12 or Freon 22.

Write today for information and prices.

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## Marsh Testing Set



...with temperature scales for  
Refrigerant -12 and -22

The finest testing instruments have been made still better. Pictured are the new models of Marsh pressure and compound testing gauges... with two scales in color showing corresponding temperatures of Refrigerant 12 and 22... with greater pressure ranges in both gauges.

In the Compound gauge, the important retard scale has been increased to read from 0 to 80 lbs., and maximum reading is increased to 250 lbs. The range of the pressure gauge has also been increased... to 400 lbs.

Their precision bronze-bushed movements give them the remarkable accuracy of 1% of reading. Like their distinguished predecessors, they have the handsome, highly-polished brass cases with sparkling beveled-glass crystals. Threaded rings make it easy to remove the crystal, giving instant access to the Marsh "Recalibrator"—quickest and best way to maintain the high degree of accuracy vital to testing. Gauges are standard with ½" N.P.T. male bottom connection with restriction screw in connection. Dial size, 2½". No servicing kit is complete without this testing set.

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# Trade Acceptance Notes Aid Payments, 'Make Businessmen Out of Dealers'

By C. Dale Mericle

DALLAS—Use of trade acceptance notes "helps make businessmen out of dealers," believes R. J. Johnson, president of Bryant-Texas, Inc., distributor for Bryant in this area.

Such notes ensure collecting from the customer after the installation of air conditioning, and, in turn, make sure that the dealer pays the distributor for the equipment.

The latter, of course, helps the distributor, but it helps the dealer as well, for it means that the money the dealer collects will be used to pay the bills directly involved on an installation instead of being put to some other use, Johnson explains. This keeps the dealer on

Trade Acceptance Note form with fields for Trade Acceptance Note No., Dealer's Order No., Distributor Invoice No., (City), (State), (Date of Note), To, (Name of Drawee-Dealer), (Address of Drawee-Dealer), On, (Date of Maturity), Pay to the Order of, BRYANT-TEXAS, INC., and/or TEXAS, INC., Dollars (\$), Accepted at, (Date), 195, Payable at, (City).

The transaction which gives rise to this instrument is the purchase and acceptance of goods by the Acceptor from the Drawer. Acceptor agrees to pay this Trade Acceptance Note in full to the holder at the end of \_\_\_\_\_ days from the date of this note, or on or before the "date of maturity" and agrees that upon Acceptor's failure to pay this Trade Acceptance Note when due to Bryant-Texas, Inc., and/or Texas, Inc., that this Trade Acceptance Note shall bear interest at the rate of 10 percent per annum on the unpaid balance until paid, and if placed in the hands of an attorney for collection, or collected through Probate Court, or Court of Bankruptcy, there shall be added a reasonable sum as attorney's fees; all parties to this note including endorser and guarantors, severally make presentment for payment, notice of nonpayment, protest and notice thereof, and without further notice hereby agree to renewals, extensions, indulgences or partial payment, either before or after maturity. Title to said goods to remain in Drawer until fully paid.

BRYANT-TEXAS, INC., and/or TEXAS, INC.  
(Signature of Acceptor-Dealer) (Signature of Drawer)

By \_\_\_\_\_ By \_\_\_\_\_

LIST OF EQUIPMENT					CUSTOMER'S NAME & EQUIP. LOCATION	
D.S.	MODEL NO.	SERIAL NO.	INV. NO.	WAREHOUSE SEC. NO. & ITEM	C. OF D. NO.	

RECORD OF PAYMENTS RECEIVED

TOTAL AMOUNT OF INVOICE \$				DATE			
DATE	CHECK NO.	AMOUNT PAID	BALANCE	DATE	CHECK NO.	AMOUNT PAID	BALANCE

TRADE acceptance note developed by Bryant-Texas, Inc. and used by many of its dealers helps in collections and keeps contractors operating on sound financial basis. Text of assignment and endorsement, printed on back of form, is given in the accompanying article.

a sound financial basis.

In actual practice with the trade acceptance note as used by Bryant-Texas the dealer does not collect from the customer. When dealer and customer sign the note, they assign the full amount to the distributor. On receipt of payment Bryant-Texas pays the dealer what's coming to him—the difference between the cost of the equipment and the price of the job, points out Johnson.

## 'Chattel Mortgage'

For all practical purposes the trade acceptance note is a chattel mortgage, because the title to the equipment remains in the hands of Bryant-Texas until the note has been paid.

"In the 18 months we've been using these notes we haven't lost one," Johnson says, and he recalls only one which involved any problem in collecting. "Even this one took only three days and minimum legal fees to collect."

Besides the obvious advantages of such notes, they also let the distributor know exactly where the equipment is going. There is provision on the form used to list the equipment involved by model number, serial number, inventory and warehouse numbers, etc., as well as the customer's name and location of equipment.

Many but not all of the dealers served by Bryant-Texas use the trade acceptance note, which is often the only contract between dealers and builders, according to Johnson.

"Those dealers who employ it are very enthusiastic about it," he claims, but as with most everything else, "the idea of using the trade acceptance note

has to be sold to both dealer and customer."

## On 30-Day Basis For Builders

On installations for builders the notes are usually set up on a 30-day basis; for jobs involving installation of air conditioning and/or heating in existing homes, the notes normally are payable on completion of the job.

When a trade acceptance note is turned into the distributor's office, he sends an acknowledgment to the customer. A notice is also sent to the customer 10 days before the payment of the note is due.

The form of the trade acceptance note is printed on an 8½ by 11-in. sheet and consists of four copies.

Reverse side of the top copy provides space for the signatures of dealer and customer for assigning of payments to the distributor and endorsement of the note.

## Where Copies Go

This top copy is held by Bryant-Texas until the note is paid. Then it is returned to the customer.

One carbon copy of the note is given to the customer, another goes to the dealer, and the remaining copy goes into the distributor's permanent files.

Wording and form of the note is shown in the accompanying illustration. Text of the assignment and endorsement on the back of the top copy is as follows:

## "Assignment of Account In Full"

"I hereby assign the full amount of the Trade Acceptance Note as shown on the

face of this instrument and request that all payments be made to Bryant-Texas, Inc. and/or Texas, Inc."

(This is followed by the dealer's signature.)

"I/We \_\_\_\_\_, shall comply with your request and make all payments for the equipment shown on the face of this instrument payable to Bryant-Texas, Inc., and/or Texas, Inc., in which it is agreed title to said goods are to remain until fully paid."

(This followed by signature of builder or user.)

## "Assignment and Endorsement Of Trade Acceptance Note"

"I/We \_\_\_\_\_ shall comply with your request of assignment and will make all payments for the total amount of the invoice as shown on the face of this instrument payable to Bryant-Texas, Inc., and/or Texas, Inc., in which title to said goods shall remain until

fully paid, and hereby endorse this note in the full amount of the invoice and note, with full recourse."

(Followed by signature of builder or user.)

First of the above is merely an assignment, but the second note involves also an endorsement.

Incidentally, this "instrument" was prepared with the help and advice of legal counsel. A lawyer should be consulted in this connection, Johnson advises, to make certain the note will be upheld in law, for such requirements may vary from state to state.

"Nearly all customers are quite willing to sign these notes, at least after they full understand their purpose, and those prospects who won't sign probably don't intend to pay anyway, and neither our dealers or we want that type of customer," Johnson avers.

## Commercial Air Conditioning

# HOW TO WIN CUSTOMERS and MAKE FRIENDS—INSTALL FRICK UNIT AIR CONDITIONERS

Now built in capacities of 3 to 15 tons of refrigeration, these dependable units are profitable to handle, and profitable to own!

Backed by over a half century of air conditioning experience. Fully warranted. Beautiful finish.

Frick units may cost a bit more but are well worth it. They are conservatively rated, and durably built by a company whose policies have been tested through 105 years of successful experience.

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WAYNESBORO, PENNA., U.S.A.

Write for Frick Bulletin 522-F giving full details of the advantages of these unit conditioners.

everything you need for everyday repairs



## PREST-O-LITE Trade-Mark REFRIGERATION AND AIR-CONDITIONING OUTFIT

One kit gives you all the equipment you need to repair, service, or install any air-conditioning or refrigeration system. Three open-flame torch stems allow you to choose the exact flame for any soldering, heating, or brazing job.

A fourth stem provides a quick and sure device for locating leaks of non-combustible refrigerant gases such as F-11, F-12, F-21, F-22, F-113, F-114, and Carrene. This detector instantly reacts to as little as 100 parts of halide refrigerant gas in a million parts of air. All stems fit interchangeably on the same cool-grip handle.

Complete outfit as illustrated above ... \$41.00 (list)

## SEE YOUR "LINDE" JOBBER TODAY

Or write for further information: LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York. In Canada: Linde Air Products Company, Division of Union Carbide Canada Limited, Toronto.

The terms "Linde" and "Prest-O-Lite" are registered trade-marks of Union Carbide Corporation.



## Will Heating Wholesaler of Future Sell 'Big Ticket' Items, Refrigeration Parts?

ATLANTA—Will the heating wholesaler of the future continue handling "big ticket" items? Will he stock expansion valves, controls, etc., for air conditioners?

These were some of the questions aired in a "workshop panel" discussion held during the 11th annual spring convention of National Heating & Airconditioning Wholesalers here.

### 'Small Dealer Depends on Wholesaler'

"The small dealer depends on the wholesaler for local stocks," pointed out Don Kinnan, Detroit wholesaler, as indication that the wholesaler will continue to carry big ticket items rather than becoming simply a seller of "hardware for contractors."

There may be a question, however, where the wholesaler will fit in with big dealers, Kinnan admitted.

Here Frank Kohles, Belmont, Calif. wholesaler, suggested that "top management should handle the large dealer. He expects special treatment."

The wholesaler shouldn't depend on one of his salesmen to handle these big dealers, many of whom buy in carload lots, especially since "some manufacturers, getting desperate, are

trying to go direct to the larger dealers," Kohles warned.

Top management of wholesaling firms should make personal calls on the big dealers, and if they require a lot of entertaining, the boss is in a better position to do it than the average salesman, Kohles declared.

"Also, if you make contacts in the field you're better able to run the whole business," he added.

### They Doubt Wholesaler Can Be By-Passed

Doubt that the wholesaler can be by-passed was expressed by such panelists as G. D. Herringa of Hart & Cooley Mfg. Co. and Bert F. Dart, Albany, N. Y. wholesaler.

"A manufacturer would need 250 to 500 salesmen to contact all the 40,000 dealers in the field, and the cost would be prohibitive," Herringa believes. "It's our opinion that accessories and component parts will always be sold through wholesalers."

Speaking as a member of a firm that has been in business 110 years, he explained, Dart is convinced that "the independent wholesaler, if he's progressive, will be in business for many years to come."

It's the personal touch and acquaintanceship with local con-

ditions that give the independent wholesaler numerous advantages over the factory operation, Dart indicated.

"Operators of factory branches seldom stay in one area very long," and they're chiefly interested in winning a promotion to the home office, he said.

Another big advantage which the independent wholesaler has, in Dart's opinion, is that of being in a better position to determine and control credit policies.

The "hot topic" of the wholesalers in this group handling refrigeration parts such as controls, valves of all types, refrigerants, etc., for air conditioning was touched upon by H. L. Godwin of Durham, N. C., who declared that "we render a lot of service and engineering for our dealers so we should be permitted to sell these parts and accessories."

"Some of our members are in the refrigeration supply wholesaling business now, a few more will get in soon, but these are in the minority," he said. "The majority will want to get into wholesaling of air conditioning supplies. The wholesaler must stock supplies and parts for maintenance of the major equipment he handles. I think we also need to sell other parts that are used universally."

### 'We Have Been Denied Access ...'

"How do we get these supplies? We have been denied access to them on various grounds," Godwin declared. "Some manufacturers said we couldn't get their products if we sell exclusively to franchised dealers; some have said we should be members of Air Conditioning & Refrigeration Wholesalers association; other objections were that the manufacturer already had adequate distribution in our territory."

"We have already made satisfactory arrangements for some items, and we're hopeful for the future on other items," Godwin said. "It's primarily a job of selling."

Discussing electric heat, R. C. Hamilton of Chattanooga, Tenn., commented, "we in the south are experiencing a revival of the sheet metal industry, thanks to central residential air conditioning. We're also reintroducing gas and oil systems."

Electric heat in TVA areas with radiant panels, electric floor furnaces, and more recently cables imbedded in floor or ceiling required little or no servicing, so there was less and less business for the old heating wholesaler, Hamilton complained.

"There's nothing better than an air distribution system for satisfactory heating and cooling," Hamilton contends, and he also pointed out that if a house is as well insulated as required for electric heating, gas and oil systems are just as economical.

He hoped, however, that manufacturers of oil and gas equipment would "include electric blast coils so other trades won't get into the heating business."

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**Leak Lock**  
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"Trace" finds leaks; "Leak Lock" prevents them. Take both on every job. They can be used with all types of refrigerants and save you time and trouble at very little cost.

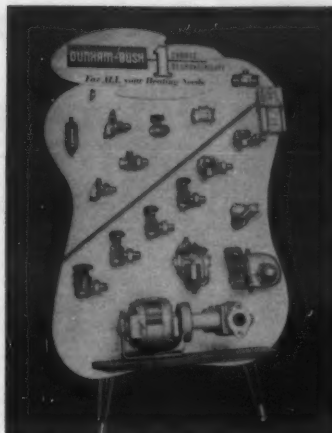
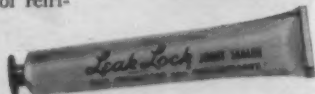
**TRACE**—the simple, fast, safe way to pinpoint refrigerant leaks... a special formulation harmless to refrigerating systems. Detects minute, intermittent leaks, even through coatings of ice or frost, and provides a positive leak tag.

**LEAK LOCK**—the joint sealer engineered for refrigeration use... seals out moisture, prevents leaks, stops corrosion... withstands rapid temperature changes and solvent action of refrigerants. Stays tacky, flexible and doesn't freeze the joint.

**Free Samples**—Ask your refrigeration wholesaler for "Trace" and "Leak Lock" or write on your letterhead for **FREE SAMPLES** to:

**Highside Chemicals Incorporated**

18 Colfax Avenue Clifton, N. J.



### Film Assists Contractors Seeking 'Package' Remodeling

NEW YORK CITY—Assistance to plumbing and heating contractors seeking "package" remodeling business is provided by the Plumbing & Heating Div. of American-Standard in a new film which they may show to consumer groups.

Called "Package for Peggy," the full-color, 20-minute sound film was developed because of a growing interest on the part of many contractors to build installation business by acting as prime contractors for "package" room remodeling.

The film shows homeowners the advantages of selecting a plumbing and heating contractor to supervise the remodeling of rooms in which plumbing or heating equipment plays a dominant role, it was pointed out.

AVAILABILITY of a new merchandiser for heating products has been announced by Dunham-Bush, Inc. Designed for use in wholesalers' showrooms and contractors' places of business, the merchandiser includes "cutaways" of D-B's hot water and steam specialty products. It will be distributed on a loan basis; substantial bookings have already been made.

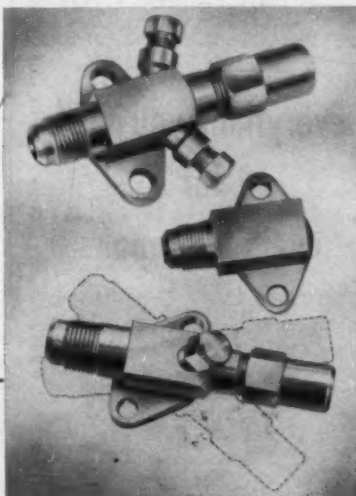
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## Perfection Heat Pump Line Introduced In 3 Sizes with Balanced Capacity on Both Heating, Cooling Cycles

CLEVELAND — Three new self-contained air-cooled "Tuck-away" heat pumps with balanced capacities on both heating and cooling cycles have been developed by Perfection Industries, Div. of Hupp Corp.

They are now being manufactured in 2, 3½, and 5-hp. sizes, according to Carl W. Millsom, vice president-sales.

The line is available in full-rated cooling capacities at ASRE standards of 24,000 to 48,000 B.t.u. and in heating capacities ranging from 22,600 to 103,400 B.t.u. using exclusive accessory duct heaters.

### 2 Sizes Adapted To Low Temperature

The 3½ and 5-hp. sizes are particularly well adapted to very low temperature conditions, Millsom reported. Both have twin compressors, controlled by a single thermostat, with step starting to reduce starting current load and increase compressor motor life.

#### Features

Features, as marked in picture above, include:

(A) Five-row diagonally mounted evaporator cooling coil matched with four-row condenser coil to deliver full-rated capacity.

(B) Distributors located at both ends of the cap tubes. Because a distributor is used for both heating and cooling, proper distribution is maintained when flow is reversed.

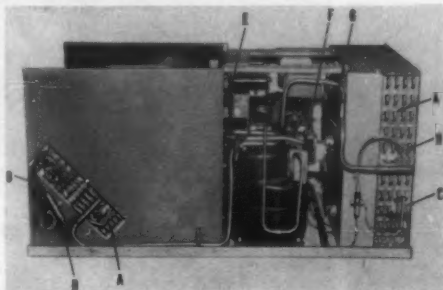
(C) De-icing accomplished by dual temperature control assures proper operation without frost and prevents unnecessary de-icing. One temperature bulb senses entering air over outside coil. Another senses refrigerant temperature in outside coil. System automatically returns to heating cycle after de-icing.

(D) Heating cap tube installed across the check valve provides two fixed resistances for refrigerant flow, with cooling and heating independent of the other. This maintains proper distribution for both heating and cooling cycles.

(E) Patented "Selectaire" metering device makes possible unlimited installation flexibility at low initial cost and allows custom tailoring of evaporator air delivery to fit specific air volume requirements.

(F) Two vibration absorbers on each compressor insure quiet, smooth operation and prevent uneven stresses on copper lines.

(G) Five-blade condenser fan dissipates normal frequency noise and operates more quietly than fans with an even number of blades.



FEATURES of Perfection heat pump marked A, B, C, D, E, F, G are explained in the text.

"Continuous condensate flow during the heating cycle is accomplished with a de-icing drain pan heater—standard on all models," the announcement said.

"It consists of a rubber-coated 'electric blanket' installed under the condenser coil which operates whenever the outside temperature drops below 25° F., preventing ice and sludge from accumulating in the condenser drain pan or drain.

### Supplementary Electric Heating

"For extreme temperature areas where additional heating capacity is desired, supplementary electric heaters are avail-

CONDENSED SPECIFICATIONS			
Model	PAS21AH	PAS31AH	PAS50H
Compressor Horsepower	2 hp.	(2) 1½ hp.	(2) 2 hp.
Dimensions:			
Width	29½"	29½"	36"
Length	49½"	49½"	64½"
Height	23½"	23½"	30"
Capacity—			
Cooling (B.t.u.)	24,000	36,000	48,000
Capacity—			
Heating (B.t.u.)	22,600	36,500	49,000
Accessory Heat Capacity (watts)	8,000	12,000	16,000

SPECIFICATIONS of the three models of Perfection heat pump.

able for step operation with indoor-outdoor thermostat. A thermal bulb is located outdoors so that the resistant heaters are actuated in sections dependent on outside temperature. Easy-reading temperature-calibrated control and a warning light are installed inside the home.

Double evaporator casing design is another feature. Entire cold air casing on the evaporator end is separate from the internal casing to provide addi-

tional protection against condensation in high humidity.

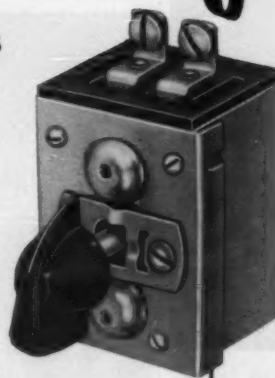
The new line is completely internally wired. Accessories available include louver kit, plenum chamber accessory kit, plenum kit, and duct heaters.

### For Your Reprint Copy

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich. Only 25¢ each.

## Compact, low cost, high capacity

# thermostats for cooling applications

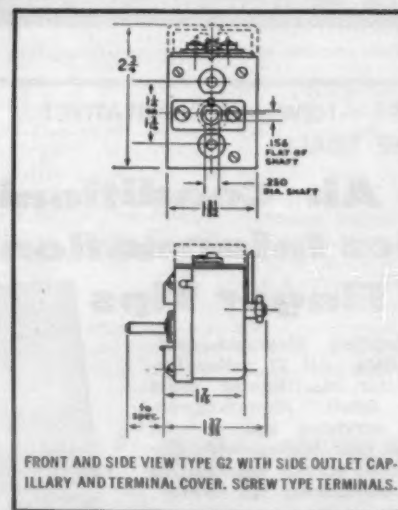


New Wilcolator Type G2 features improved, snap-action switch for higher contact ratings

With its improved, snap-action contact mechanism, the new Wilcolator G2 thermostat offers you much higher contact ratings than have hitherto been available in such a compact unit. Measuring only 2¼ x 1½ x 1⅞ in., it nevertheless has ample capacity for heavy duty appliances and medium industrial requirements.

Temperature differential is adjustable and can be factory set to your specifications. The G2 unit is available with Constant Cool position (motor load) where required. Contact mechanism not affected by vibration. No TV or radio interference. All steel parts heavily plated for corrosion resistance.

For complete information, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N.J. In Canada: Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont. Export Address: Wilcolator, 1010 Schaff Bldg., 1505 Race St., Philadelphia 2, Pa.



FRONT AND SIDE VIEW TYPE G2 WITH SIDE OUTLET CAPILLARY AND TERMINAL COVER. SCREW TYPE TERMINALS.

### SPECIFICATIONS

Standard temperature range: 55°F-95°F  
Special temperature ranges: To customer's requirements  
Switch mechanism: Single pole, double break, snap action  
Motor ratings: 120 to 240 v a-c; running current—14 amp; locked rotor—60 amp  
Mounting: Back of panel or in enclosure  
Standard shaft: ¼ in. diam. flatted to .156 in.; length to customer's specifications  
Terminals: Screw type, AMP or Arkes

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At the General Offset Printing Co., Springfield, Mass., this CPU-40 pre-engineered Dunham-Bush unit, a complete air conditioning system housed in one cabinet, maintains relative humidity at 50-55% and temperature of 72°. Selected and installed by Don Tryon, Springfield engineer and contractor, design features of this commercial package unit permitted air conditioning large areas with no structural changes in the building. Unit handles paper cutting room and pressroom of this modern printing plant.

## THE NEWS IN PICTURES



BETTY COED, CLASS OF '78—Perky little Gail Burgmeier looks hopefully at Michael Kane, manager of Carrier Corp.'s Ice-maker Dept., which is giving a \$10,000 college scholarship as top prize in its current Ice-maker sales contest. The winning salesman can select any student of his choice to receive a college education—all expenses paid. The money will be put in trust at the Chase Manhattan Bank of New York until the recipient is ready to enter college. All participants will have an equal chance, with performance rated on the potential of each sales territory.



## Refrigeration Wholesaling Has Advanced . . .

ANYBODY RECOGNIZE H. R. McCombs (l.) awaiting his first customer at the spanking new McCombs Supply Co., Denver on May 23, 1938? With him are Webb Bowman and R. C. Kimmel. Kimmel (r.) is now secretary, treasurer, and assistant manager of the company. The new firm, said the NEWS report at the time, "will endeavor to make available . . . a complete assemblage of all material and products (needed) for refrigeration and air conditioning work in addition to any advice or suggestions which they (customers) may desire."



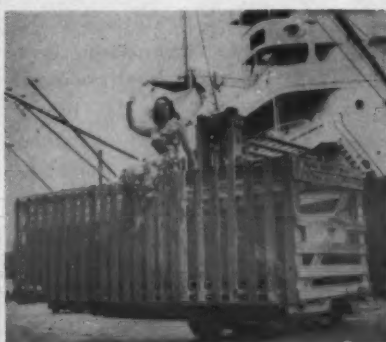
## . . . A Long Way In 20 Years

WHAT CHANGES 20 years have wrought! Brilliant lighting, seats for customers, self-service, attractive displays, and shirt-sleeve selling. In its two decades, the firm expanded three times, moving into its present headquarters in 1952. "We will continue the same policies in the future that have proven successful the first 20 years," McCombs declared.

SIX members of the Toledo chapter of the Refrigeration Service Engineers Society pose with a 40-year-old Audifren refrigerator, which soon will be added to the collection of the Record Museum of Air Conditioning in Los Angeles. The unit was installed in the Administration building of Willys Motors, Inc., when it was erected in 1917, and was in service until about 1933. Paul D. Sizer, Acme Refrigeration Co., Toledo, came upon the massive antique while servicing Willys refrigerating equipment and arranged to donate the machine to the museum. Left to right are the chapter members who volunteered their time and services in removing and shipping the unit.

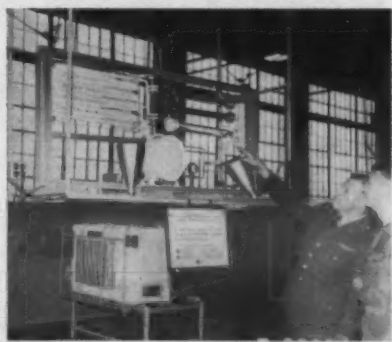


HERE is a new twist in displays. A unit that permits distributors to adapt a display to their own needs. Not just a counter, wall, window, or hanging mobile—this display can be used in practically every showroom no matter how crowded.



THIS Hawaiian girl had a warm smile for what is believed to be the largest shipment of supermarket equipment ever made in the Pacific. Some 475 lin. ft. of McCray refrigeration cases, enough for an entire supermarket, were delivered in Honolulu from the Matson freighter "Hawaiian Refiner." This equipment weighed 70,000 lbs. and filled four railroad cars. The shipment was made by Silcox Refrigeration Corp. of New York City, exclusive export representative for the McCray Refrigerator Co., Inc., Kendallville, Ind.

RIGHT: Army troops receiving training in refrigeration at the Engineer School, Fort Belvoir, Va., now are able to see the actual formation of frost. This refrigeration training aid, built by the model shop at the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, employs a standard 1/2-hp. refrigerator compressor, but the tubing is plastic instead of copper.



## CHIEF DEVELOPMENT ENGINEER

Opportunity for man approximately 30 to 35 with engineering degree to assume full responsibility for product development, model shop and testing laboratory in one of nation's leading air conditioning companies. Must have approximately 8 years' experience in refrigeration engineering, preferably in air conditioning. Must know instrumentation, product and development, and laboratory procedures. Must have supervisory experience, capable of supervising staff of engineers and laboratory technicians. This position is at the department head level and reports to the Vice President-Engineering. Very good starting salary with opportunity to advance in salary and grow with the company. Send resume to Personnel Director. THE O. A. SUTTON CORPORATION, MANUFACTURERS OF VORNADO PRODUCTS, 1812 West Second, Wichita, Kansas.

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## Developments In Jetliner Cooling

### Carrier Produces 8-lb. Compressor To Power 15-Ton Airplane System

SYRACUSE, N. Y.—A new approach in the manufacture of refrigeration equipment is in use at Carrier Corp. for producing jet passenger plane air conditioning systems.

And some of the engineering developments that were vital in putting together a system that would develop 15 tons of cooling capacity from a refrigeration compressor weighing no more than 8 lbs., may lead to broader uses of such a system, even in ground applications.

#### LAB-LIKE MACHINE SHOP

Instead of the usual production line Carrier has created a laboratory-like machine shop, equipped with the latest in precision tools and gauges to turn out this revolutionary air conditioner for the Douglas DC-8. The unit itself has been dubbed the "Mighty Mite" because its 8-lb. compressor can deliver up to 15 tons of cooling. This capacity is developed by tiny parts revolving at supersonic speed.

Such high speeds require accuracy to within 50 millionths of an inch. To achieve this precision Carrier set aside a brightly-lit, carefully air conditioned production area. It hired highly-skilled machinists and gave them the most modern tools and measuring devices available. Even a watchmaker was employed to fit parts and check dimensions that must be accurate to the 50th part of a human hair.

#### COOLING CONTROLS TEMPERATURE

Air conditioning rigidly controls temperatures in the machine shop to prevent errors in measurement. A five degree variation could throw a dimension off beyond tolerances, as much as 15 millionths of a half inch diameter.

Similar care goes into production of the lightweight condenser and evaporator coils. Entirely fabricated of aluminum they weigh a total of 90 lbs. Total weight of the system is 150 lbs.—less than average man.

#### VAPOR CYCLE UNIT

The Mighty Mite is a vapor cycle compressor—used in a conventional refrigeration cycle specifically designed for aircraft cooling. It is driven by air bled from the jet turbines and, at full load, turns at 90,000 r.p.m. When the jet engines are off, the compressor operates by pneumatic power supplied from a mobile ground source.

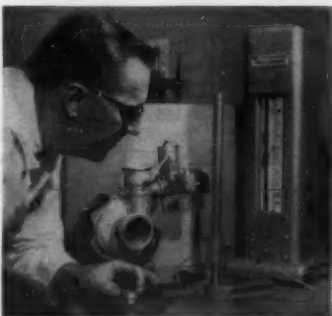
The condenser is cooled by "ram air" during flight while a blower takes over at low air speeds and on the ground. The fan spins at 11,000 r.p.m. from pneumatic power supplied by the jet engines or the mobile ground supply.

Everett Palmatier, manager of Carrier's transportation equipment department, says the availability of pneumatic drive removed one of the most serious deterrents to the application of the vapor cycle to aircraft—that of a lightweight drive.



BLOWER FAN for DC-8 cooling system—Darwin Traver, development engineer for Carrier Corp. holds a blower fan which is driven at 11,000 r.p.m. by compressed air supplied by the jet turbines. It operates only on the ground to circulate air over the condenser coil. In flight "ram air" is ducted to the coil and leaves the airplane through a controlled flap. The fan is driven by compressed air forced against the tiny turbine vanes on its outer perimeter.

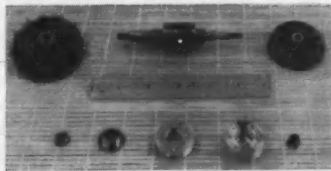
RIGHT: Where Mighty Mite is "flight tested"—this is the mockup required to put the Mighty Mite through its paces. Each part of the cooling system is mounted as it will be in the DC-8 and is put through all the rock and roll, climb and dive motions it will encounter in flight. The Douglas specification requires that both compressor and turbine impellers be burst at well above maximum speed and that all parts be contained within the casing. Carrier engineers had to weaken the parts purposely to cause this "breakup" which was safely confined by the machine's outer shell.



RIGHT: Laboratory-like production line turns out cooling systems for the Douglas DC-8. In this carefully air conditioned shop highly-skilled machinists work with modern precision machinery to produce tiny components for the 15-ton compressor. Measurements must be true to within 50 millionths of an inch. The tiny compressors made here have as much capacity as the 15-ton air conditioner that cools the entire shop area. Temperatures are kept constant so that the minute parts won't vary in size.



counter on the control panel accurately measures the compressor's speed.



ABOVE: Compressor parts for jet air conditioner—these are the working parts of the Carrier "Mighty Mite" compressor which develops almost 15 tons of cooling for the Douglas DC-8 jetliner. The wheel at left is the turbine driven by compressed air from the jet engines; at center is the shaft; on the right is the compressor impeller which spins at supersonic speeds. When assembled these parts take up less room than the 6-in. scale shown and require accuracy to within millionths of an inch. The entire compressor is made of high-strength aluminum alloys except for the turbine impeller and the shaft.



LEFT: Watchmaker precision for DC-8 air conditioner—a watchmaker employed by Carrier uses an air gauge which measures millionths of an inch, to check a part for the compressor shown in the background. He and other technicians work for accuracy equal to the 50th part of a human hair. This exacting precision is required for the compressor which turns at supersonic speeds to develop up to 15 tons of cooling. Despite its capacity it weighs 8 lbs. and can be held in one hand.



LEFT: Checking "heart" and "blood pressure"—a technician holds a stethoscope to the "heart" or compressor of the Mighty Mite air conditioning system to check smoothness of operation while another reads indicators showing pressure and speed. Compressed air at over 400° F. is used to drive the unit in the laboratory simulating the pneumatic drive from jet engines during flight. The compressor "cruises" at 90,000 r.p.m. but has been "revved up" to almost twice that during tests. An electronic

ARE you in need of a "just right" man to fill a slot in your organization—the man you are looking for will be reading the

NEWS' CLASSIFIED ADS

## Commercial Air Conditioning

### Men on the Move . . .

Bryant Mfg. Co.—ROBERT J. FAIRHEAD has been appointed eastern regional sales manager for this Carrier Corp. division. He will be responsible for sales of Bryant heating and air conditioning products in the northeastern states and District of Columbia. His headquarters will be in Philadelphia. In addition, RALPH C. TERHUNE has been named central regional manager with headquarters in Columbus, Ohio. His area will cover six states.

Dunham-Bush, Inc.—CLARK D. AKERS has been named sales department manager for the Marshalltown, Iowa office.

Wolverine Tube, Div. of Calumet & Hecla, Inc.—NEAL HARTWELL has been appointed sales representative in the Wisconsin area with headquarters in Milwaukee. He will sell and promote copper water tube, refrigeration service tube, and automotive tube to wholesalers. JACK D. ZINSER has been named sales representative in western Pennsylvania to promote copper, brass, and aluminum tubular products. He will headquarter in Pittsburgh.

MELVIN A. JACKSON was named sales representative in the Indiana-Ohio area with headquarters in Dayton, moving from Chicago. CHARLES A. JOHNSON moves from Detroit to Chicago as sales representative. He will headquarter in Evanston.

Worthington Corp.—JOSEPH GOLDSTEIN has been appointed staff engineer of headquarters engineering. He will provide assistance on engineering phases of product quality improvement and cost reduction of refrigeration compressors at Air Conditioning & Refrigeration Div., Holyoke, Mass. He was formerly with York Corp. and chief engineer for Lehigh Mfg. Co.

Amana Refrigeration, Inc.—JAMES P. BUTLER, formerly national field merchandise manager for Norge Sales Corp., has been appointed regional sales manager, New York region. JOE RISNER has been named sales manager, Chicago branch. He was previously Norge Chicago factory branch sales manager.

Minneapolis-Honeywell Regulator Co.—HARVEY W. ODOM, branch industrial manager at Wichita, Kan., has been named sales manager of the New Orleans industrial branch office. He will be succeeded at Wichita by ELDRED E. JONES.

Century Electric Co.—BAKER TERRY, St. Louis office application engineer, has been promoted to manager of that office. TED A.

BENDER has been named branch office manager in Seattle. BRUCE CALLAHAN was named salesman in the San Francisco branch. H. C. KNAPPENBERGER, formerly Tulsa, Okla. branch office manager, has moved to Syracuse as branch manager. R. A. JERVIS, a former St. Louis sales office manager, has been named Tulsa manager.

Queen Products, Inc. (Albert Lea, Minn.)—W. J. MARINAN, formerly full line merchandising manager of Hotpoint Co., has been named advertising and sales promotion manager of this subsidiary of King-Seely Corp.

Trane Co.—ARTHUR M. MOODY, chief engineer, centrifugal compressor products, has been promoted to chief product development engineer. ARNE FRANK, who joined Trane in 1957, has been named senior development engineer, reciprocating compressors. GERALD T. KERBOW, Houston, Texas office sales engineer, has been upped to manager of that office. H. J. DALTON, San Antonio office manager, has retired. He is succeeded by his son, Frank, formerly a sales representative.

American Air Filter Co., Inc.—CHARLES KANNAPELL has been transferred from the Louisville branch office to the Washington, D. C. branch. COLLINS HAMBLEN has been moved to the New York City office from the Washington office. CHARLES JACOBS has been transferred to the New York City office from Minneapolis. WILLIAM PETERS has been named New York City branch office manager. He was assistant general sales manager of Anemostat Corp. of America.

Rubatex Div., Great American Industries, Inc.—DONALD E. CORNMESSE, previously works manager for Bridgeport Rubber Co., has been appointed plant manager.

Heating & Air Conditioning Div., Stewart-Warner Corp.—Appointment of LARRY D. GRANT, formerly vice president-general sales manager of Stiglitz Corp. and sales manager of General Air Conditioning Corp., has been appointed central Pennsylvania district sales manager. WILLIAM E. SULLIVAN, New Jersey district manager for Airtemp, has been appointed southern New Jersey district sales manager.

Climate Supply Co., Inc. (Dallas)—JOHN LINKOUS has joined the firm as salesman covering Dallas and northeast Texas.

S. & R. Soda Fountain Mfg. Co., Inc.—Appointment of Edward Butkera as office manager of the New York office has been announced.



# NEW airvec

The Fanless . . . Noiseless . . . Air-Cooled Condenser

NO WIRING, NO NOISE, NO OPERATING EXPENSE, NO MOTORS, NO MAINTENANCE.

AIRVEC—a new principle in air conditioning. So new, so revolutionary that all other condenser types are made obsolete. Manufactured in 2, 3, 5, and 7½ ton basic coil sections, which then can be assembled in multi-sections for unlimited capacities up to hundreds of tons. For supermarket installations, units will be circulated for fractional tonnages as required. Head pressure control also available. WRITE AIRVEC DEPT., EDWARDS ENGINEERING CORP. Manufacturers Agents Inquiries Invited.

DEVELOPED BY MANUFACTURERS OF INDUSTRY'S MOST WIDELY USED WATER-COOLED CONDENSERS.

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with these advantages:



- COST REDUCED 30% to 40%
- CONDENSER WATER REDUCED 35%
- Refrigerant Charge Reduced
- Stabilizes Capillary Performance
- Smaller Cooling Towers Required
- Shipping Weight Reduced
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- Sea Water Models Available

**EDWARDS ENGINEERING CORP.**  
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## TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

Elsewhere in this issue appears an article describing European objection (technical, not political) to the ASRE system for designating refrigerants. An alternate system, considered more scientific and practical by some, has been proposed by the International Institute of Refrigeration. This article appeared in a Russian journal.

### 'WINDOW UNIT SHORTCOMINGS'

In the same journal appears an article which lists "the shortcomings of present models of window air conditioners."

A comprehensive theoretical and practical evaluation of thermoelectric refrigeration — including data on several successful two-stage household refrigerators — is presented in a recent issue of a German refrigeration magazine.

These are examples of pertinent technical information being presented in foreign industry papers and periodicals. A review of several such periodicals reveals that other countries are behind us in some areas, ahead of us in others, and just about where we are in most.

An example of the first category might be the recent discussion of calcium chloride for drying refrigerants. Europe is just now reaching the point where authoritative statements are made that this desiccant

should not be used in refrigeration — a point this country reached years ago.

In the field of thermoelectric refrigeration, the evidence seems conclusive that other countries are far ahead of us. At a recent technical society meeting, Prof. Hugh Keeler, University of Michigan, reported that the Russians have had household refrigerators using two-stage Peltier effect refrigeration since 1948. This thermoelectric refrigeration is supplying 23° F. on the cold surfaces and producing 131° F. on the heat rejection end.

### BRITISH PATENT

A new British patent in the same field describes the use of a generating thermocouple and electrical resistance heater for heating the thermocouple. In conjunction with the refrigerating couple, this system is claimed to remove 100 watts from the refrigerating chamber for every 150 watts input.

In most subjects foreign progress is near the same stage as ours. Their journals describe such things as studies of the thermal efficiency of finned tubes, low temperature problems, leak testing, lubrication problems, and economic conditions.

Generally speaking, even the practical, serviceman-type articles in the foreign press contain

greater engineering and theoretical detail than do their American counterparts. This is due in great part to the fact that Europeans and Asiatics show a great respect for academic learnings while we tend to belittle engineering talk and egg-head subject matter when we are discussing something as practical as adjusting the drip pan on a defrost system.

### EDITORIAL OPINION

(Parenthetically: in coming to realize that the applied science which made American technology so effective was based on basic knowledge gained by "pure scientists" who were mostly not American, this country is veering to the opposite extreme and placing scientists and engineers of all sorts on a pedestal which they neither desire nor deserve. This evaluation is obviously an editorial opinion, not a statement of indisputable fact—FJV.)

Relative to the foreign papers, the important thing to remember is that there is much valuable information to be gathered from such sources. From an academic viewpoint, we may be interested in those areas where we are ahead or behind them. Practically, we might be more interested in how they are solving problems common to all countries.

In many cases, they seem to be attempting the same solutions as we. In others, they are investigating approaches which apparently have not been considered here — or have not been publicized.

One example: "Working with suitable lubricants, copper plating cannot be initiated by water."

This is heresy in most American circles.

### EXAMPLES

Here are a few examples of the type of things currently appearing in foreign papers:

Thermal conductivity and diffusion of water vapor in insulating materials

Explosion-proof lamp to find leaks in refrigerating machines

Maximum enthalpies of atmospheric air

Ventilation and air conditioning of rail cars

Automation in low temperature systems.

As can be seen, there is a good mixture of theoretical and practical information.

While *Refrigeration Abstracts*, in this country, attempts to present summaries of major articles in the refrigeration and air conditioning field, its foreign coverage is unfortunately

limited, so that the *Abstracts* alone are not sufficient to keep one abreast of foreign developments.

Some of the foreign periodicals print an English summary of their major articles so that it is possible to determine the general subject matter and conclusions. It is significant that English is rapidly replacing French as a second international language.

Articles of interest can be fully translated on request by various translation agencies — usually associated with a library or engineering college.

The exchange of information can be two-way — with Americans contributing material to the foreign press. One example which comes to mind, probably because it is the most recent, is an article on moisture indicators by Ansul Chemical Co. in one of the German publications.

### WATCH ADS

Aside from the editorial material, there is much value in observing advertising in foreign publications. A very good idea of their design and application concepts, and the appearance of their equipment, can be formulated from the photographs and descriptions appearing in ads. Incidentally, some American firms are advertising in the foreign journals.

While foreign products in the heating and cooling industry have not been felt much in this country, they are making head-

way in Central and South America. This accounts for the fact that great emphasis is placed on foreign technical information — including U.S.A. periodicals — in Latin America.

### PERIODICALS LISTED

Following is a list of some major foreign periodicals. The full mailing address of each may be obtained by writing to the News.

Belgium—Revue Refrigeration  
Denmark—Kulde  
England—World Refrigeration  
France—Bulletin de L'Institut International du Froid  
Revue Generale du Froid  
Revue Pratique du Froid  
Germany—Die Kalte  
Kaltetechnik  
Italy—Il Freddo  
Netherlands—Mededelingen  
Norway—Norsk Fryserinaering  
Sweden—Kylteknisk Tidskrift  
Spain—Revista del Frio  
U.S.S.R.—Kholodilnaya Tekhnika  
Australia—The Refrigeration Journal  
Argentina—La Tecnica del Frio  
India—The Heat Exchanger

Since there is a frequent interchange of information among the several foreign periodicals, it would be practical to pick one from the European continent, another from England, and one from the East to get an over-all look at foreign developments.

## Work Safe in '58

DON'T GAMBLE WITH  
HARSH CHEMICALS — USE

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## Your Best Deal!

For Water-Cooled Equipment

Regular Solvex

Solvex Maintenance

Ultra Solvex

Solvex Algae Control

CSCO Ice Machine Cleaner

See your Wholesaler or write:

## CHEMICAL SOLVENT CO.

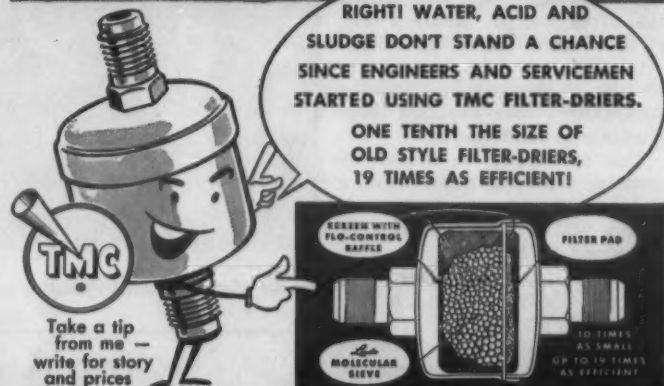
P. O. Box 487

Birmingham, Ala.

### HEATING AND AIR CONDITIONING DISTRICT SALES REPRESENTATIVE

Loading manufacturer of warm air heating and residential air conditioning equipment needs District Representative to call on established wholesale accounts in New England. Must have substantial experience in residential heating and/or air conditioning, own a car and be free to travel. Salary, expenses and bonus.

Address your resume to BOX A6023,  
Air Conditioning &  
Refrigeration News



**TUBE MANIFOLD**  
CORPORATION  
435 BRYANT STREET • N. TONAWANDA, N. Y.  
Another Product of the World's Largest Manufacturer of Liquid Receivers



## ARI's Home Cooling Plans--

(Concluded from Page 1, Col. 5)  
Corp., as president of ARI.

Conclusion by a panel of "experts" that the residential air conditioning manufacturers should concentrate their sales and promotion efforts on builders of new homes.

Announcement that the 12th ARI Show will be held in Detroit in February, 1962.

Plans for Project SMAC, designed to sell the basic values of residential air conditioning, were unveiled at a meeting of ARI's Air Conditioning Div.

William A. Bours III, director of sales for du Pont's "Freon" Products Div. and chairman of the program management committee for SMAC, announced that all segments of the industry would be invited to participate.

### 'Requires Full Cooperation'

He emphasized that, to be successful, the program requires full cooperation of everyone who benefits from the sale of home air conditioning—manufacturers, component part suppliers, distributors, dealers, builders, utilities, contractors, and lending institutions.

Bours also announced the appointment of John S. Robinson, formerly sales manager of heating and air conditioning products for A. O. Smith Corp., as director of the project.

Robinson explained that Project SMAC will utilize all principal media of publicity, consumer advertising, dealer and builder merchandising, and other vehicles to sell the basic benefits of air conditioning.

### Actual Promotion Set for 1959

Robinson said the program in 1958 will be devoted largely to a development study, and that actual promotional activities will begin in time for the 1959 selling season.

The certification program for room air conditioners was adopted by ARI's Room Air Conditioner Section. The program will provide that room units tested and rated in accordance with the ARI Standard 110 may be marked by a seal or certificate which is a guarantee to purchasers of its cooling capacity under the nationally accepted standard.

A resolution passed by the Section declared that: "... to further implement the now-established rating program (the Section) immediately proceed to adopt a Certification Program effective Oct. 1, 1958, embracing 1959 models. This program shall include the following points:

### Program Points

"1. A contract between each participating manufacturer and ARI which binds the manufacturer to test his product under the applicable ARI Standard, submission of that data upon acceptance of which permission is granted to use an ARI seal of certification on that product and in his advertising.

"2. This contract will provide for random testing by independent laboratories, and revocation of the certificate and seal if the unit or units do not meet published specifications.

"3. This program will be financed by sales of the seals of

certification" ... at a price to cover both testing and promotion of the program.

A committee of the Section will be named to put the program into effect. At the same time, the ARI Room Air Conditioner Section agreed to continue its statistical, rating, and promotion programs, and expressed the feeling that the Section should remain as a prominent factor of ARI for the following reasons:

"1. Virtually all manufacturers of room air conditioners are active in not only room air conditioning, but other phases of development of year-round air conditioning for residential and commercial purposes.

"2. While room air conditioners are frequently merchandised through major appliance outlets, they require more specialized application and selling techniques than other major appliances in order to give complete user satisfaction.

"3. After several years of concentrated effort, the ARI Standards and rating program have been accepted with confidence by the public at large, dealers and distributors, better business bureaus, Federal Housing Administration, General Services Administration, Department of Defense, and other governmental agencies.

"4. The ARI Standards and rating program have become an important merchandising factor used by the entire air conditioning industry.

"5. The room air conditioner belongs in ARI because of ARI's total concentrated attention on air conditioning and refrigeration products. Because of this, the room air conditioning industry will accelerate at a faster rate within ARI."

### Six Mfrs. Resign

Despite these arguments, six manufacturers reportedly have resigned from the ARI Room Air Conditioner section to join the new NEMA section. They are Fedders-Quigan Corp.; Frigidaire Div., General Motors Corp.; General Electric Co.; Hotpoint Co.; Kelvinator Div., American Motors Corp.; and Mitchell Mfg. Co.

As reported in the May 5 issue of the NEWS, member companies of the new NEMA section stated that they plan to promote existing industry product standards and B.t.u. rating programs.

### Outlines Unitary Cooling Certification

The certification program for unitary air conditioners approved by the Unitary Air Conditioner Section of ARI and by the National Warm Air Heating & Air Conditioning Association, was outlined at the meeting of the Air Conditioning Div.

A. F. Ward of Worthington Corp., chairman of the section, said the unitary certification program is based on compliance with ARI Standard 210 and provides that cooling capacity ratings of unitary equipment be expressed in British thermal units per hour (B.t.u.h.) or tons, but not in horsepower of compressor motors, which, it is felt, is not a true measure of capacity. (Description of pro-

gram was published in April 21 issue of NEWS).

Unitary air conditioners include central residential units, self-contained air conditioners such as those used in commercial applications, and other coolers that operate as units, as differentiated from large system installations.

In suggesting concentration of sales and promotion efforts on builders of new homes, the panel on residential air conditioning argued that older homes will "come along" in order to keep up with the modern trend.

Perry I. Prentice, editor and publisher of *House and Home* magazine, was moderator of the panel. Its members included Neil Connors, architectural engineer for the Federal Housing Administration; Arthur S. Goldman, director of marketing for *House and Home*; Richard N. Jones, sales director for the same publication; and Kentner Wilson, vice president of Minneapolis-Honeywell Regulator Co.

Prentice, who sponsored a round table discussion in New York last August on the subject of residential air conditioning, pointed out that all the "bottle-necks" discussed at that meeting had been eliminated. These included FHA regulations involving higher income requirements for purchasers of air conditioned homes, FHA regulations on the financing of room air conditioners on home mortgages, the "tight money" situation of last year, and a number of others.

"And now," he told members of the air conditioning division, "you're on your own."

### 'Builders Knocking Themselves Out'

Members of the panel said applications for FHA appraisals on new homes are up as much as 160% and builders are "knocking themselves out" to take advantage of the "sudden flood of money" being offered them under relaxations of Federal Reserve Board policies.

It was also pointed out that the new home market is relatively concentrated. Fifty per cent of all new homes were built in six states in 1957; 75% in 15 states; thus air conditioning manufacturers could reach the market with "rifle" technique instead of scattering their efforts.

The panel suggested working with builders to install air conditioning in "model homes" which are seen by an estimated 40 million people each year. They offer an opportunity to "showcase" the industry's products to many at relatively low expense, it was said.

If the new home market is adequately covered, the panel felt, owners of existing homes will become potential customers just to keep their own homes modern and in line with new construction.

Another speaker on the Division program was Bert Lange, manager of marketing services, *Life* magazine. He outlined the potential of residential air conditioning as revealed by *Life* surveys.

ARI's new president, Don Petrone, succeeds Lud Emde, president of Temprite Products Corp. Petrone has been vice president of ARI for the past year.

Elected to succeed him in the

vice presidency was Rudy Berg, vice president of Copeland Refrigeration Corp., who has served as ARI treasurer.

The new treasurer is L. N. Hunter, senior vice president for engineering and research of National-U.S. Radiator Corp.

The three newly-elected officers, together with Emde, as immediate past president, and ARI Managing Director Geo. S. Jones, Jr., will make up the executive committee.

Twelve newly-elected members of the ARI board of directors took office at the meeting. They were:

Carl E. Buchholzer, president, Airtemp Div., Chrysler Corp.; Emde; John Engalitcheff, Jr., president, Baltimore Aircoil Co.

R. L. Gibbs, general sales manager, Mueller Brass Co.; Thomas Hancock, executive vice president, The Trane Co.; Bruce D. Henderson, vice president, Air Conditioning Div., Westinghouse Electric Corp.

H. F. Hildreth, president and general manager, The O. A. Sutton Corp.; Henry O. Kirkpatrick, general manager, American Mfg. Co.; F. E. Lehman, manager, commercial sales department, Frigidaire Div.

R. K. Serfass, vice president, York Div., Borg-Warner Corp.

John J. Swisher, sales manager, Savage Ice Cream Cabinet Div., C. V. Hill & Co., Inc.; and V. D. Wissmiller, market manager, Commercial Div., Minneapolis-Honeywell Regulator Co.

## Refrigerant Designations--

(Concluded from Page 1, Col. 4)

That the recommended nomenclature is indeed straightforward is demonstrated by the fact that NEWS editors were able to determine the basic system with no knowledge of Russian and with only the international chemical symbols carrying any meaning for them in the article. (Comprehensive evaluation of the proposed terminology must await completion of our first Russian lesson!)

The IIR system assigns a position to carbon then to each of the halogens—fluorine, chlorine, and bromine in that order. Numerical designation for each halogenated refrigerant is based on the number of carbon atoms, then the number of each halogen atom in order.

Refrigerant-12, for example, whose chemical formula is  $\text{CCl}_2\text{F}_2$ —or  $\text{CF}_2\text{Cl}_2$ —is designated as refrigerant 122 in the proposed nomenclature. The 1 stands for the number of carbon atoms; the first 2 stands for the fluorine atoms; the second 2

stands for the chlorine atoms.

Refrigerant-22, chemical formula  $\text{CHF}_2\text{Cl}$ , is designated refrigerant 121. A look at several designations at one time conveys the basic system. See Table of Comparative Terminology.

Speaking of refrigerants other than the halogenated refrigerants, the Russian article concludes, "there is no practical necessity for introducing arbitrary designations for ammonia, sulfur dioxide, water, air, etc., which according to the American standard are designated by the arbitrary number 700 with the addition to it of the value of the corresponding molecular weights."

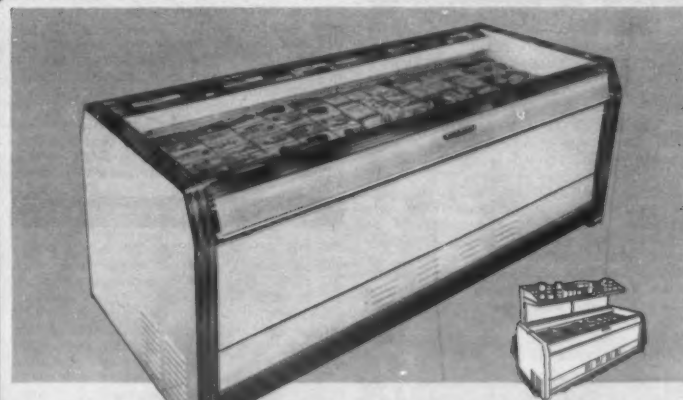
TABLE OF COMPARATIVE TERMINOLOGY

ASME Designation	Chemical Formula	Proposed By IIR (ABCD)*
Refrigerant-12	$\text{CF}_2\text{Cl}_2$	122
-13	$\text{CF}_2\text{Cl}$	131
-22	$\text{CHF}_2\text{Cl}$	121
-114	$\text{C}_2\text{F}_2\text{Cl}_2$	242
-13B1	$\text{CF}_3\text{Br}$	1301†
-113	$\text{C}_2\text{F}_3\text{Cl}_3$	233
(Carbon tet)-10	$\text{CCl}_4$	104‡

\*Position A, carbon; B, fluorine; C, chlorine; D, bromine.

†("no chlorine" indicated by zero)

‡("no fluorine" indicated by zero)



## Ice cream stays brick hard in Warren's new Self-contained

Strictly brick hard ice cream day and night—day in, day out—thanks to drastic subfreezing temperatures and a sure, unique defrosting system. Proved performance in tropical and high-humidity climates. A wide-open display and a more-than-generous capacity, too.

A one-shelf merchandising canopy, of the same top-quality materials and workmanship as the cabinet itself, is optional. The adjustable shelf adds impact to impulse items or even staples, and invaluable economy from this maximum use of floor space. The cabinet is genuine porcelain and the canopy, baked enamel—both finishes acid resistant and rugged. The good looks is Warren Diamond Jubilee styling. Warren COLORAMICS® bands optional at no extra cost.

There's no simpler, surer way to block-busting packages of ice cream, merchandised right, than in the new Warren Self-contained.

**Warren Refrigerators**

P. O. BOX 1436 ATLANTA 1, GEORGIA

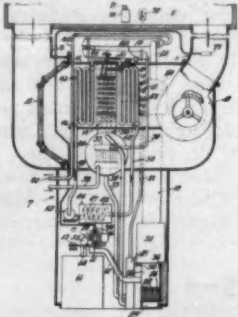
EXPORT DIVISION: P. O. BOX 27884, LOS ANGELES 27, CALIFORNIA



# PATENTS

Week of Feb. 11  
(Continued)

**2,923,015. HEAT EXCHANGER SYSTEM FOR AIR CONDITIONER.** Eugene P. Whitlow, Evansville, Ind., assignor, by mesne assignments, to Arkis Air Conditioning Corp.



3. In an air conditioner, an air conditioning chamber, means for circulating air through the chamber, a heat operated refrigeration system having a cooling element in the chamber, a heating system providing a closed circuit for heat exchange fluid and having a heat exchange section in the chamber at the front of the cooling element in

the direction of air flow, a heat exchange section in the chamber at the rear of the cooling element in the direction of air flow and a heat exchange section outside the chamber....

**2,923,048. VALVE UNIT.** Howard J. Hansen, Bay Village, Ohio, assignor to The Hansen Mfg. Co., Cleveland, Ohio.

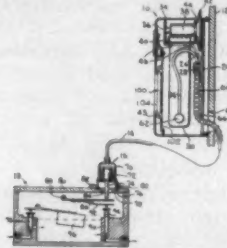


1. A valve unit comprising a stem having a head, a removable gasket surrounding said stem behind said head, a removable backstop having a central opening slidably receiving said stem, a helical spring surrounding the stem, pressing said gasket forward against said head, and at its other end bearing said backstop, the backstop being disposed between said projection and said spring and being held at right angles to said stem by the rear end of said spring.

**2,923,965. THERMOSTATIC CONTROL.** Roy W. Johnson and William A. Biermann, Milwaukee, Wis., assignors, by mesne assignments, to Controls Co. of America, Schiller Park, Ill.

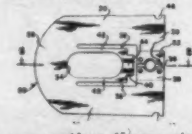
1. A mechanical thermostat comprising a base plate adapted to be mounted on a wall, a temperature sensing element mounted on the base plate and including a rigid shell having a flexible bellows mounted therein to define therewith a variable volume chamber, the chamber being charged to vary the pressure in the chamber with tem-

perature variations, the inside of the bellows being exposed to atmospheric pressure, a shaft rotatably mounted



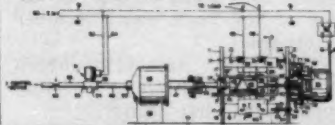
on the base, a cam on the shaft, means for rotating the shaft and cam....

**2,923,283. SNAP-ACTING THERMOSTAT AND BIMETAL BLADE THEREFOR.** Homer F. Malone, Millburn, N. J., assignor to The Wilcolater Co., Elizabeth, N. J.



1. A snap-acting thermostat element comprising a sheet of bimetallic material having high and low-expanding faces and provided with a U-shaped slot spaced inwardly of the edge of the sheet and defining a tongue and a surrounding border, the end border portion of the sheet adjacent the free end of the tongue being compressed in the plane of the sheet and at right angles to the sides of the U-shaped slot, the border area of the sheet alongside the tongue and adjacent the root end thereof being generally concave on the high-expanding face of said sheet at temperatures below an operating temperature, said border area of the sheet being generally concave on the low-expanding face of the sheet at temperature above said operating temperature....

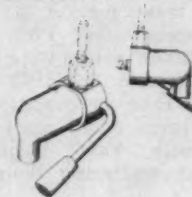
**2,923,285. CONTROL APPARATUS.** Albert E. Stone, La Grange, Ill., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.



1. Apparatus of the class described comprising a support having a pair of end plates spaced apart; a plurality of U-shaped brackets on said housing arranged parallel to one another and in a cylindrical fashion about an axis; a shaft journaled in said end plates and extending parallel to said brackets along said axis; a member having a helical cam surface thereon secured to said shaft....

## DESIGNS

**182,066. BEVERAGE DISPENSER PAUCET.** Irvin J. Albert, Philadelphia, Pa., assignor to Soda Dispenser, Inc., Philadelphia, Pa.



Week of Feb. 18

**2,923,430. REFRIGERATOR DOOR GASKET.** Evans T. Morton, Knoxville, Ill., assignor to Midwest Mfg. Corp., Galesburg, Ill.



2. A door sealing gasket comprising a body having a base portion adapted to be connected to a door or the like, a curved section connected at its opposite ends to said base portion and between its ends extending away from

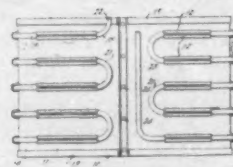
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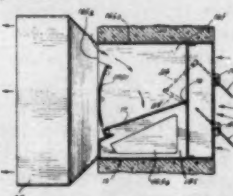
the base portion toward a frame of an opening to be sealed and providing a hollow space between itself and the base portion, a rib on the exterior surface of said curved section extending at an angle from said curved section....

**2,923,522. EVAPORATOR CONSTRUCTED FROM EXTRUDED SECTIONS AND METHOD THEREFOR.** William A. Collins, Dowagiac, Mich., assignor to Rudy Mfg. Co., Dowagiac, Mich.



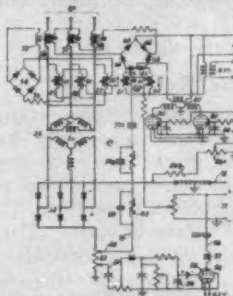
1. In an evaporator, an extruded plate having spaced pairs of walls extending outwardly from one surface thereof in parallel relation to each other, said walls being interrupted at spaced points, and a sinusoidally formed tube having straight portions disposed between said spaced walls and secured therein by bent-over portions of the walls, the tube and plate forming at least a bottom and two side walls with corners therebetween provided at said interrupted points.

**2,923,600. AIR CONTROL DEVICE FOR A BUILDING HAVING AIR CONDITIONING.** Arthur D. Cole, St. Paul, Minn.



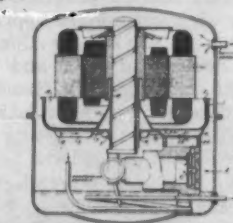
1. An air control device for a building having in combination, a casing having a chamber therein, said chamber having a wall with an opening therethrough connecting said chamber with the outside atmosphere, said chamber having an opening at one side thereof connecting the same with the inside of said building, said casing having a second chamber therein, said casing having a wall between said chambers having an opening therein through which said chambers are in communication....

**2,923,757. CONTROL OF ELECTROSTATIC PRECIPITATOR CURRENT BY ELECTRICAL MEANS.** Hans Klemperer, Belmont, Mass., assignor, by mesne assignments, to Apra Precipitator Corp., New York, N. Y.



1. In a power supply system for an electrostatic precipitator having an alternating current source, a high voltage transformer with its primary winding connected to said source, a power rectifier connected to the secondary winding of said transformer with its high voltage side connected to electrodes of said precipitator and its low voltage side connected to ground....

**2,923,850. CARRIER FOR A MOTOR COMPRESSOR OF A REFRIGERATING MACHINE.** Rudolf Hintze, Neuenhain uber Bad Roden am Taunus, Germany, assignor to Stempel-Hermetik G. m. b. H., Frankfurt, Germany.



1. A carrier for the motor compressor of a hermetically sealed refrigerant machine comprising, in combination, two sheet metal members at least partly overlapping and joined fluid-tightly to each other, said sheet metal members respectively being formed with aligned tubular extensions extending away from each other....

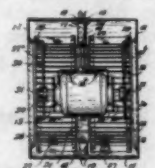
**2,923,952. DIRECT DRIVE BLOWER UNIT.** Norman G. Busch, Columbia Station, Ohio, assignor to Air Controls, Inc., Cleveland, Ohio.

1. A direct drive air blower unit

**Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented**

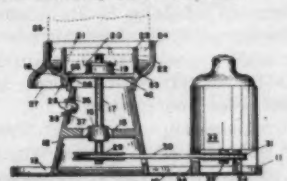
Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Address orders to: Commissioner of Patents, Washington 25, D.C.

comprising, a casing including side walls having aligned inlet openings through which air is drawn into the unit and an outlet opening in fluid



communication with the area between said inlet openings, a circular support band axially disposed in said casing midway between said inlet openings with its axis co-axial with relation to the axis of said inlet openings, support means supporting said band in said casing in said position....

**2,923,570. ICE SHAVING MACHINE.** David Davison, Baltimore, Md.



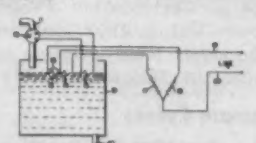
1. A device for use in producing finely divided ice; said device including a hollow casing having its top and bottom edges arranged in parallel planes, a bell component carried by said casing, an ice shaving structure, means for driving said structure including a shaft, and means mounted on said shaft for rotation about a vertical axis....

**2,923,932. REFRIGERATING SYSTEM AND METHOD OF MAKING THE SAME.** Charles E. Hickman and Allen L. Goldsmith, Adrian, Mich.



1. In a refrigeration system, a fluid conducting part formed of aluminum tubing and another fluid conducting part formed of tubing of a metal that can readily be soldered, a tubular fluid conducting transition piece connecting said tubing in fluid flow relationship and formed of a tubular layer of aluminum and a tubular layer of readily solderable metal, a pressure tight joint integrally uniting the readily solderable tubular metal part of the transition piece and the tubing of the readily solderable metal....

**2,924,275. LIQUID LEVEL SENSING APPARATUS.** Donald C. Johnston, Richfield, Minn., assignor to Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.



1. Control apparatus comprising a bridge network having a reference negative temperature coefficient impedance which is shielded so as to be affected only by ambient temperature and having unshielded sensing negative temperature coefficient impedance, said impedances being connected in adjacent legs of the bridge network....

(To Be Continued)

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**SENIOR PROJECT or chief engineer—**An aggressive self-starter, full of initiative & enthusiasm for broader engineering or manufacturing responsibilities. Seventeen years' experience handling engineering & manufacturing problems. 5 years of which have been design & product engineering of refrigeration & air conditioning systems, especially heat pumps. BOX A6008, Air Conditioning & Refrigeration News.

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**MANUFACTURER'S REPRESENTATIVE** for well known line of refrigeration and air conditioning compressors, condensing units to 5-75 tons, package liquid chillers up to 300 tons, and cooling towers 5 to 60 tons. Knowledge of air conditioning necessary—a number of important territories are now available. No objection

to heating or other compatible lines. Write fully. BOX A6017, Air Conditioning & Refrigeration News.

**DEALER SALES manager** wanted to operate department and sell Carrier air conditioning and heating equipment for distributor in large city in Middle Atlantic States area. Previous sales experience and engineering knowledge in air conditioning field preferred. Excellent opportunity. Give full information in reply. BOX A6026, Air Conditioning & Refrigeration News.

**WANTED—DISTRICT Manager.** For New York and Pennsylvania area by manufacturer of super market line of refrigerated display equipment. Must have previous experience in order to qualify. Excellent opportunity for the right man. Replies kept strictly confidential. Send complete information in initial letter to BOX A6027, Air Conditioning & Refrigeration News.

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## Servicing Automobile Air Conditioners

(Vol. 2)

BY C. DALE MERICLE

The Edsel auto air conditioner is the twentieth make to be discussed in this series. Makes previously described were A.R.A., Artic-Kar, Frigette, Frigikar, Kauffman, Mark IV, Airtemp, Mobilette, Novi, Vornado, Polar-Temp, American Motors, Buick, Cadillac, Chevrolet, Chrysler, DeSoto, Dodge, and Plymouth.

### EDSEL

Edsel Div.  
Ford Motor Co.  
Dearborn, Mich.

A front-end type air conditioner is offered as an optional accessory on the Edsel, introduced in September, 1957.

Compressor is mounted on the car engine and is driven through a magnetic clutch. Condenser is located in front of the radiator. Evaporator assembly, which also includes the car heater core, is mounted beneath the dash on the fire wall. Blower is mounted on the engine compartment side of the fire wall.

Control of the 1958 model Edsel conditioner is achieved through an adjustable thermostat which cycles the magnetic clutch and thus the compressor. Included in the control arrangement is a servo unit (electric motor) which positions the cooling thermostat, heating control, and dampers for fresh air, recirculated air, and windshield defrost in response to the setting of a dial on the control panel.

Refrigerant-12 is employed in the Edsel system. Complete charge is 3½ lbs. in the 1958 model.

#### Compressor

The Tecumseh HH two-cylinder compressor is used. This is mounted on the left side of the engine.

Suction and discharge service valves are mounted on the compressor in the Edsel system.

Compressor is fitted with a magnetic clutch.

#### Condenser

Condenser is mounted in front of the car radiator.

A combination receiver, dehydrator, and filter assembly is mounted vertically on the right side of the condenser. There is a rupture disc in the receiver designed to break and release refrigerant to the atmosphere if pressures in the system become excessive.

Sight glass is located in the liquid line. It is attached to a bracket on the car battery carrier.

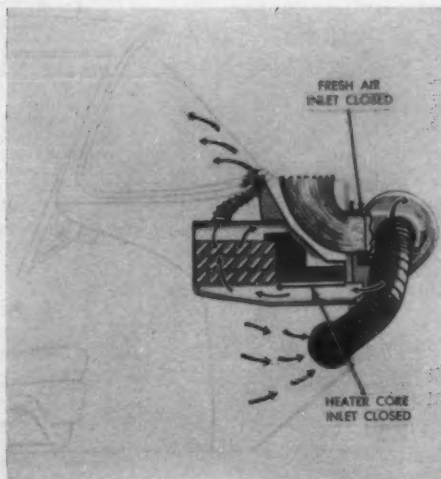
#### Evaporator

Evaporator assembly (Figs. 1 and 2) is located inside the passenger compartment under the right side of the instrument panel. It includes the evaporator proper, heater core, thermostatic expansion valve, thermostat controlling the magnetic clutch and dampers for directing air either through the evaporator or heater core.

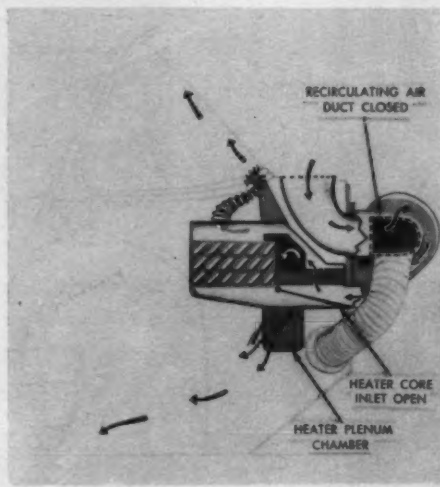
Two-speed blower, which serves for both cooling and heating, is mounted on the fire wall in the engine compartment. As part of the blower housing there is a damper which controls the intake of fresh air through a grille in the cowl.

Recirculated air only is employed in the 1958 Edsel system for cooling. Heating uses 100% outside air.

On the cooling cycle (Fig. 1) air is drawn from the passenger compartment through a recirculating air duct in the right-hand cowl. The duct houses an electro-static type air filter. Air is then forced by the blower through the cooling coil section of the evaporator as-



ABOVE: Fig. 1 shows air flow in Edsel conditioner when controls are set for cooling.



RIGHT: Fig. 2 shows air flow in Edsel system when heating and windshield defrosting are in operation.

sembly, and thence through ducts to adjustable air outlets at the base of the windshield (Fig. 3).

These air outlets are also used for windshield defrosting.

On the heating cycle (Fig. 2) outside air is forced through the heater core of the evaporator assembly and is discharged toward the floor from the heater plenum chamber directly below the evaporator assembly. For windshield defrosting, heated air is discharged through the outlets at the base of the windshield which are also used for cooling.

#### Controls

Controls of the 1958 Edsel air conditioner consist of a toggle type blower switch and a single rotating dial (Fig. 3) that controls cooling, heating, and windshield defrosting.

The controls are part of the car instrument panel.

Blower switch has three positions providing for off, high speed, or low speed.

The "Dial-temp" heater and air conditioner control dial is mounted on a shaft that terminates in a pinion and rack assembly. The rack is part of the control cable attached to the control arm of the servo unit (electric motor) installed in a horizontal position behind the left end of the instrument panel.

All valves and dampers and the cooling thermostat in the air conditioning and heating systems are automatically positioned by the servo unit through flexible cables.

To obtain cooling, the blower switch should first be turned to

high speed and then the dial is rotated from its center "off" position to the first detent or "Min" position in the "Cool" range. This closes the outside air intake, positions the damper in the evaporator housing to direct air flow through the cooling coil, and turns on the thermostatic switch which in turn energizes the electrical circuit to the magnetic clutch.

With the dial control set for minimum cooling, the thermostat is in its highest temperature range. Turning the dial control towards the "Max" position lowers the thermostat setting.

To obtain heating, the dial is turned in the opposite direction from the center "off" position to the "Warm" range. Turning the dial beyond the "Max" position in the "Warm" range brings it into the "Defrost" range for windshield defrosting. There are "Min" and "Max" positions in both the "Warm" and "Defrost" ranges.

Temperature control throughout these ranges is by a thermostatic valve which regulates a vacuum-operated hot water valve in the heater water inlet.

With the dial in the "Warm" and "Defrost" ranges, the system operates on 100% outside air, and the damper in the evaporator assembly is positioned to direct all the air through the heater core. With the dial in the "Defrost" range, a damper in the heater plenum chamber is positioned to deflect the heated air upward through the air outlets at the base of the windshield.

(To Be Continued)

## Service & Supplies

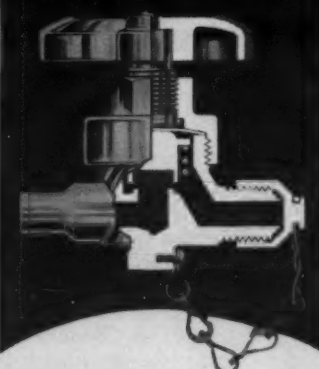


FIG. 3—Controls of Edsel unit include a blower switch and a single rotating dial for both cooling and heating. Note air outlets at base of windshield.

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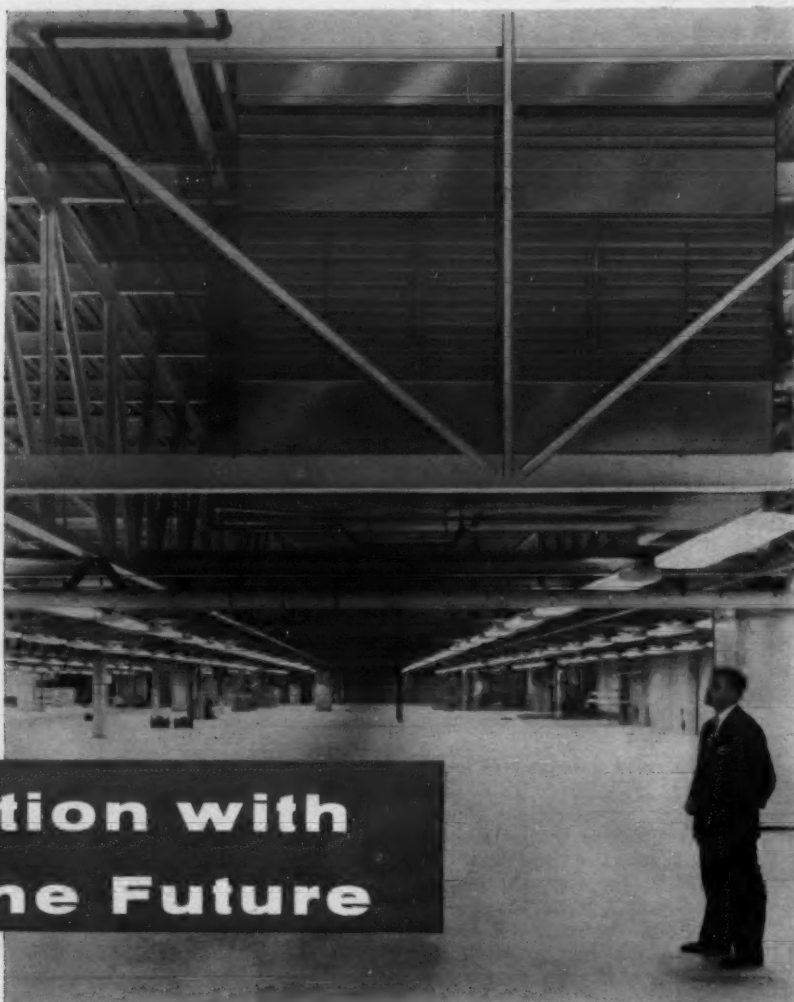
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